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# QUEENSLAND AGRICULTURAL JOURNAL

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## Event and Comment.

### Agricultural Progress in Queensland.

THE Annual Report of the Department of Agriculture and Stock, which was presented to Parliament by the Minister, Mr. W. Forgan Smith, in the course of the month, contains much valuable and interesting information on the development, extension, and general progress of primary industries in Queensland. Reviewing the position of agriculture in the State, the Under Secretary, Mr. E. Graham, said: On all sides there are indications of healthy expansion, and a general improvement in the agricultural situation within the State marked the period under review. This was due to bountiful and well-distributed rains over most of the farming areas.

Certain districts, however, suffered reverses as a result of an excessively wet season. Serious floods, attended with regrettable loss of life, occurred in the Central Division. Besides the loss of valuable lives, which he recorded with deep regret, much material damage and destruction of live stock occurred in some of the flooded country. The season otherwise was generally favourable.

### Conditions in Divisional Areas.

IN the Southern Division autumn rains encouraged an extension of cropping in the wheat areas, particularly on the Darling Downs. Early winter precipitations were lighter throughout the Downs and the Maranoa, with the result that the first promise of a good wheat germination was not entirely fulfilled. The country immediately west of the main Dividing Range was more favoured, beneficial spring rains ensuring satisfactory yields.

The months of October, November, and December were remarkable for a succession of very wet weeks which delayed harvesting and December had nearly ended before the last of the crop was in the bag. Though the continued rains had given rise to some apprehension, ultimate yields proved that the damage to the wheat crop was quite negligible. As a matter of fact, early estimates were, in many instances, well below actual production.

Wheat pool deliveries amounted to 3,575,000 bushels, and when due allowance is made for reservations for seed and feed the 1927 harvest was little less than four million bushels.

Other crops in the Southern Division responded well to the favourable season, though they suffered later from excessive wet weather. The early maize harvest was the heaviest for some years. Late planted crops were affected by serious floods in some of the maize-growing regions. Estimates, in consequence, were not always realised. A visitation of mice caused a further reduction in the aggregate maize return which was approximately four million bushels.

Agricultural operations in the Central Division were interrupted or retarded by heavy and continuous summer rains which exceeded the average falls in most of the farming districts. Otherwise the season in Central Queensland was generally favourable and satisfactory yields of cotton and other crops were obtained. There again earlier forecasts were not fulfilled on account of excessive soil saturation and insufficient sunshine during the growing period.

In the Northern Division similar conditions prevailed in the agricultural areas.

The general revival from seasonal reverses in some of the farming districts again demonstrated the remarkable recuperative powers of the State.

Among the first grain harvested for the year on the Darling Downs was a field of "Novo" wheat which was propagated and distributed the previous year under the departmental wheat propagation plot scheme. The yield, 40 bushels, was an early indication that the season was to be one of production beyond the ordinary. Many crops returned from 40 to 50 bushels an acre, the highest recorded yield being 66⅔ bushels. In obtaining these results no fertilisers whatever were used.

The quality of Queensland wheat was proved in competition with grain from every State at the last Royal Show in Sydney where Downs growers gained a substantial share of the honours.

From results obtained it is evident that the wheat-breeding work at the Roma State Farm is having an important influence on the establishment and extension of the wheat industry in this State. It is also apparent that as a fodder and grain crop wheat is receiving much more attention from Queensland producers.

The departmental wheat propagation scheme, in which the Wheat Board is also interested, is proving its value generally as a means of bringing improved varieties into cultivation and also maintaining the types commonly cultivated in this State. An encouraging aspect of this work was the success achieved by growers who secured seed of varieties bred on the Roma State Farm and which was distributed by the Department. Details of this important work are set out in another section of this report.

It is noteworthy that the comparatively heavy yields on the Downs, which were produced without the use of manufactured manures, were largely the result of the more general application of better methods of cultivation.

Good progress is being made in the development of the new strain of "Durum" maize on the Atherton Tableland, to which I referred at length in my last report. By careful selection work, in which the botanical and other characteristics required in seed plants are studied very closely, a special type of grain is gradually being evolved. It is now possible to extend this propagation work on a thousand-acre unit basis. The aim in view is to provide sufficient seed of this new maize to meet all Northern Tableland requirements.

Progressive experimental and other investigational work on tobacco cultivation in the North is proceeding satisfactorily.

Peanut production is approaching the limit of consumption and efforts are now being directed towards encouraging the more general use of the "nut" as a dietary article; and also a wider exploitation of its oil properties.

The provision of storage facilities and the installation of modern machinery at an approximate cost of £50,000 is engaging the attention of the Peanut Pool Board at Kingaroy. This is an indication of the progressive spirit animating those associated with this new industry.

As the result of experimental work in the Northern Division is has been ascertained that potatoes harvested in September may be kept in cold storage for five

months at a temperature ranging from 34 to 40 deg. F. and planted after the wet season in the following April. This suggests the possibility of producing a winter potato crop in North Queensland. It has been ascertained, too, that potatoes grown on the temperate tablelands are suitable as seed for our tropical coastal regions, also that a reciprocal arrangement in respect to a continuity of seed supplies in the North is quite practicable.

Good results are accruing from the operation of the scheme for the improvement of farm horses. Since its inception in 1923-24 over fifteen hundred services have been recorded. The State stallions have left their mark in every district in which they have been utilised and many of their stock have already won distinction in the show ring. Draught horses of good type still command good prices throughout the Commonwealth, and the desirability of improving the breed within the State by continuing this useful service to the farmer is evident.

## The Journal and Departmental Publicity.

AFTER covering the whole range of agricultural activity, the Report goes on to say that additional information on the science, economics, and practice of agriculture is being collected continuously by the Department through research, field observations and experiments, and laboratory work, and this knowledge would be of little value to farmers and others concerned if it were not made available to them in a readable and digestible form. In this connection the "Queensland Agricultural Journal" and Departmental publications perform a useful service.

Officers engaged in directive, educative, and specialised work have made full use of the media at their disposal, and it is due to the regularity and practical value of their contributions that the Journal has become an acknowledged authority on the industry it efficiently serves; and that this and other Departmental publications have an ever-widening circulation. As a publication dealing with the principles and practice of agriculture in this State the Journal has proved of definite value to those engaged in primary production, and there is evidence that it is appreciated accordingly.

Many new or revised bulletins and pamphlets on subjects of especial cultural or scientific importance were published by the Department in the course of the year.

Departmental officers have also contributed to a comprehensive radio programme in co-operation with the Queensland Government Radio Service. Lectures so delivered consisted of brief digests of seasonal information, facts, and general educational matter prepared in narrative form and covering a wide range of topics.

The making and releasing of a series of cinematographic films, showing the development, progress, and present standards of our chief primary industries, was also an important feature of the Department's publicity work. In addition numerous photographic prints, depicting the various phases of country life and its wealth and progress in Queensland, were also distributed through approved channels.

Information of a strictly news nature relating to the agricultural situation, Departmental activities, and seasonal notes on farming practice, plant and animal pests and diseases, is prepared and issued regularly to the metropolitan and country Press.

There is ample evidence that agricultural news is regarded as of general and increasing importance, and more space is being apportioned by the daily Press to notes and informative articles on the industry. This is a very healthy sign.

## A Better-Balanced Industry.

THE present situation of agriculture in Queensland reveals a general tendency towards a better balanced industry. Much more study is being given to the economics of agriculture. Farmers are realising that a season of heavy production does not necessarily mean the attainment of a full measure of prosperity, for price problems are immediately created by over-supplied markets. In much recent discussion the fact has been stressed that the surplus problem is at the root of the farmers' difficulties. There are two obvious lines of approach to this problem—namely, through balancing output with market requirements, and systematised marketing. Much thought is being given to the subject, but it is obvious that no general formula will cover all commodities and conditions in all parts of the State. Every district and every commodity has its special marketing difficulties awaiting complete solution. Through concentrated and co-ordinated effort, aided by appropriate legislation favouring the industry in Queensland, much is being attempted towards evolving a satisfactory system of orderly marketing which will benefit both the producer and the consumer.

# Bureau of Sugar Experiment Stations.

## CANE PESTS AND DISEASES.

*Mr. A. N. Burns, Assistant Entomologist at Mackay, has submitted the following report for the month ended 12th September, 1928, to the Director of the Bureau of Sugar Experiment Stations, Mr. H. T. Easterby:—*

### Increase of Army Worm (Several Species) Damage.

Damage from these pests commenced to show up a few weeks ago in young ratoon cane, but was caused by one species only, *Cirphis loreyi* Dup., the lesser army worm. Within the last two weeks, however, a good deal of injury has shown up in places, so far ratoon cane only being affected. Numerous larvæ of the true army worm, *Cirphis unipuncta* Haw., also *C. loreyi*, another species, probably *Prodenia exempta*, and two other species that have not previously come under the writer's notice as feeding on sugar-cane, have been collected in the vicinity of the Laboratory. Large numbers are being bred to obtain their natural parasites; however to date no parasites have emerged.

Infestation in each instance appears to be fairly local, and the areas attacked are extensive. The injury to the cane leaves can be readily seen from a considerable distance. As many as eight larvæ have been collected when sheltering in the central leaves of one cane shoot; this number might not have actually been the total number attacking that particular cane plant, as many caterpillars hide under clods of earth, in crevices, and under debris, &c.

The larva of the true army worm, *C. unipuncta Haw.*, differs fairly considerably from the caterpillar of the lesser army worm, *C. loreyi* Dup. A brief description is as follows:—Length, approximately 1½ inches. Dorsal and subdorsal area dark smoky brown or black suffused greenish. Dorsal line lighter in colour, and edged on either side with a thin black line; midway between this and the subdorsal stripe on either side is another longitudinal black stripe, and in the subdorsal area on each side a broad blackish longitudinal stripe. Immediately below this is a broad pinkish grey or pale brownish broad lateral stripe, above which is situated the spiracles, one to each segment, very minute, black. Ventral area dull greyish or yellowish green. Legs yellowish brown, pro-legs and claspers yellowish green, black at and near their terminations. Head, shiny brown with two black bands extending from the vertex to the mandibles. Between these, and on their outer sides are a few scattered black dots, giving the head a slightly mottled appearance.

These caterpillars are very voracious feeders, and in consequence they grow very fast, attaining at the present time their total larval development in less than three weeks. Individual larvæ vary very considerably in the intensity of their coloration, the range of colour being from dark greenish black to pale yellowish or greyish green, more or less suffused with black. Pupation takes place in the soil, the larva constructing a loose cocoon made of soil particles, &c., held together with a few silken threads. The pupa or chrysalis measures about ⅝ of an inch in length, and is dark ochreous brown in colour. The time occupied in this stage is brief, ranging from twelve to twenty-one days, according to the season of the year; development is more rapid during the warmer months.

The adult moth measures from 1½ to 1⅝ inch across the expanded wings, and is coloured as follows:—

Forewings (above): Yellowish or reddish brown, obscurely marked with minute blackish dots and patches. Near the centre of the wing at the outer end of cell is a small whitish spot circled blackish.

Hindwings (above): Pale yellowish brown suffused blackish near the outer edges, the suffusion being darkest nearest the edges. Veins brown-black, clearly defined. Wings with a pearly opalescence, when viewed from certain angles.

Forewings (beneath): As above but paler, yellowish grey towards apex and outer edges, an obscure smoky patch bordering edges and end of cell.

Hindwings (beneath): Pale yellowish brown suffused silvery grey, dusted with scattered and very minute darker dots. A few small black spots along cilia at edges except near lower angle.

Control measures recommended in last month's report for larvæ of *C. loreyi* will also serve to efficiently control this, and any other leaf-eating species of army worm attacking sugar-cane.

**Apparent Scarcity of Digger Wasp Parasites of Cane Grubs.**

For some months past specimens of these useful parasites have been sought after to breed under artificial conditions at the Laboratory, also to obtain data regarding their life-cycles and habits in the Mackay district. No specimens at all were observed during the late summer months, and it is only lately that any specimens have come under observation.

Farther north, in the Cairns district, numbers of these wasps could be taken at any time feeding from the nectar of flowering weeds growing along the headlands of canefields; but the few examples taken by the writer in this district have either been captured on the wing whilst flying over fallow land, or from the foliage of a scrub-tree growing near the Laboratory.

Two abundant species of these digger wasps occur in northern canefields; *Campsomeris tasmaniensis* Sauss. and *Campsomeris radula* Fabr., and all the specimens but one taken in this district were of the latter species. Another factor which tends to prove their scarcity is that whilst following ploughing operations in grub-infested canefields in different parts of the district, on two occasions only have their cocoons been collected, and then one only in each instance.

The female digger wasp after entering the soil and locating a third-stage grub of the greyback (*Lepidoderma albohirtum* Waterh.) or frenchi (*Lepidiota frenchi* Blkb.) cane beetle, seizes its victim and inserts its sting into the ventral portion of the grub's thorax, thus paralysing it, but not killing it. The wasp then lays its egg on the ventral surface of the grub's abdomen, usually on the sixth segment. In about three days' time the wasp egg hatches, and the young wasp larva or maggot inserts its head into its host's body and so sucks out the interior substances, leaving, when it is fully fed, in about a week or so, only the shrivelled skin of the cane grub. The wasp larva now spins a brown parchment-like cocoon, in which it transforms into the chrysalis stage, emerging a few weeks later as a perfect wasp.

These digger wasp parasites are themselves controlled naturally by hyper-parasites; i.e., insects which are parasitic on them. These hyperparasites attack the wasp in its larval or maggot stage, and the two most common of these are the larvæ of Bombylid or Bee Fly, and the grub of a beetle belonging to the family Rhipiphoridæ (feather-horned beetles).

In this district digger wasps appear to be controlled naturally to a very considerable extent, from the evidence that so few have been observed, and that a large Bombylid Fly (*Hyperalonia funesta*?) is very plentiful at times in canefields. Large numbers of these flies were seen, and many captured in the Station grounds during the later summer and early winter months.

**Predaceous Enemies of Cane Grubs.**

During the past few weeks examples of larvæ of Asilid or "robber flies" have been brought to the Experiment Station, and have also been observed during cultural operations in canefields.

Growers may often observe whilst ploughing, a long white, fairly hard, legless grub or maggot, with a minute black, pointed head. These are beneficial insects, and are the larval or maggot stage of an Asilid fly. The adult flies are usually some shade of brown or brownish black, with fairly long legs, and rather elongate bodies. They are usually about an inch in length, though some species are considerably larger. They make a conspicuous buzzing whilst in flight, but settle frequently, usually on sticks, fence posts, &c., and they somewhat resemble some species of wasps. The female fly lays her eggs in a mass of foliage, sometimes on a blade of grass or a cane leaf. The young maggots on emergence make their way through the soil till they locate cane grubs, which they pierce by means of their sharp heads, and suck out the juices from the grub's body. These fly larvæ account for many cane grubs during the period of their larval development, and probably other species of beetle grubs also fall victims to them.

Two species of Asilid flies occur freely in this district, one, a little over an inch in length and expanse of wing, much resembles a well-known species (*Promachus doddi*. Bezzi) from the Cairns district. The other species is considerably larger, but is not quite as plentiful as the smaller one.

Attempts are being made at the Laboratory to breed through some of these fly larvæ in order to be able to determine correctly the identity of the species and their different larvæ.

# ENTOMOLOGY FOR THE YOUNG FARMER.

By EDMUND JARVIS, Entomologist.

*Mr. Jarvis, Entomologist at Meringa, near Cairns, has submitted to the Director of the Bureau of Sugar Experiment Stations, Mr. H. T. Easterby, the following report for the period August to September, 1928. He discusses among other topics some advantages likely to be derived by the sons of canegrowers from an elementary study of sugar-cane entomology.*

## Entomology has Attractions for the Rising Generation.

In an article appearing in the Press recently it was stated that in a district like that of Cairns, "where the growth of sugar-cane is of paramount importance, it is vital that we understand the creatures that attack the cane." The present writer is much in sympathy withany form of activity calculated to encourage among young people of the Cairns district a liking for nature study, and particularly for those branches of science directly associated with the sugar industry, which would naturally possess an interest to all concerned in its future welfare.

About twenty-five years ago Mr. Frank Tate (late Director of Education) introduced nature study into the curriculum of the Victorian State Schools. Each head teacher was asked to form a small museum of natural objects, built up from the material brought in by the children from day to day; the specimens collected (whether animal, vegetable, or mineral) being afterwards named and exhibited in one of the classrooms in suitable glass-topped cases.

It may be mentioned in this connection that good work is at present being carried out at the Gordonvale State School, where the children are encouraged to help to beautify portions of the school ground by growing ornamental trees, flowers, and shrubs. Such disinterested wholehearted work, while calling for the exercise of patience, care, and forethought, can hardly fail to develop in the children characters of unselfishness, together with a love of form, colour, and other natural beauties. "Learning by doing" is one of the watchwords among boy scouts, and might well apply also to school children.

Attempts have recently been made in America to interest their boy scouts in entomology. A prominent naturalist in the Oakland district (Brighton C. Cain, M.A.) tells us that "since scouting and outing go hand in hand, a subject like entomology is admirably suited to the scout method of training." "A very important factor," he remarks, "in building character is the bringing of the individual into better understanding and appreciation of the unfathomable beauties of Nature, and of Nature's God. Where in all the world about us is there a more wonderful field than Entomology for just this sort of thing? With the seemingly limitless variety of forms, the vast arrangement of colours, the great diversity of habits, and the marvellous inter-relationships presented by the insect world, what a golden opportunity is ours for instilling *real* reverence in the boys of to-day who will soon be 'the men of to-morrow.'"

Before a boy can obtain an "Insect Life" Merit Badge he must show a box of fifty different insects, collected, mounted, and labelled by himself; and must have reared at least one species of insect through all of its life-cycle stages of growth; and, moreover, be able to go into the field or forest and point out a large number of species in their natural haunt. Similarly, research work of this nature could be made attractive to the sons of our canegrowers, by organising regular rambles or excursions through cane areas and adjoining forests in search of destructive and beneficial insects, &c.

I need hardly state that the Bureau of Sugar Experiment Stations is keenly interested in any form of activity having for its object the spread of scientific information respecting cane insects and their associates. Every encouragement will be afforded to children or others desiring to make such collections of insects. The names of any specimens can be supplied from the official collection at Meringa Experiment Station, where, at the same time, full information may be obtained, if required, as to approved ways of capturing insects, killing, handling, setting, mounting, preserving, and protecting them from dust, ants, cockroaches, &c.; and with regard to the apparatus needed by a young collector.

### "Army Worm" Control.

During the months of August to October cane is likely to be damaged by caterpillars of the noctuid moths *Laphygma exempta* Walk., *Cirphis unipuncta* Haw., and *C. loreyi* Dup. The present season has been very favourable to the increase of these so-called "grass caterpillars" and "army worms," outbreaks of which have been reported from canefields in the Babinda, South Johnstone, and Cairns districts.

Much has been written concerning "Caterpillar Plague" and "Cutworms," under which general headings the larvæ of several of our noctuid moths are classed. Three of these happen to be cane pests, while several other species wage a continual warfare against market gardeners and fruitgrowers.

Having already briefly described and figured the species affecting cane (Bulletin No. 3 of Sugar Bureau, Div. of Ent., second edition, revised, pp. 35-42), I shall only touch at present on those control measures which have proved to be the cheapest and most effective against such caterpillars.

### Recommendations.

In the event of big stools of cane being attacked, the trouble does not, as a rule, call for treatment unless the caterpillars chance to be only half-grown (about ¾ of an inch long), and present in alarming numbers. Should an infestation of this kind, however, be noticed amongst young plant or ratoon shoots about 12 inches in height, no time must be lost before fighting the pest.

### Methods of Prevention.

Never allow big weeds or rankly growing grasses to stand between cane rows, as these noctuid moths usually deposit their eggs in such situations. Keep all headlands clean; and in the event of grass land occurring outside boundary fences watch such growth for the appearance of caterpillars, which if present (but too small to attract attention) may, later on, invade the adjoining cane land. Waste grass country of this sort should be burnt over during Spring and Autumn months, as such practice coupled with clean cultivation of the cane will go a long way towards preventing a recurrence of "army" or "grass" caterpillars.

### Arsenical Sprays.

Unfortunately, many of the outbreaks of "army worm" are not reported until most of the damage has been effected, and it is too late to save much of the crop. In such cases the best plan of procedure is to endeavour to prevent further spread of the caterpillars into undamaged portions of the field. To this end a strip of undamaged cane a few yards wide, and situated just in front of the advancing caterpillars should be sprayed with an arsenical solution to form a poisoned barrier.

In field practice we have found lead arsenate to be the cheapest and best spray to use, applied in the proportion of 2 lb. lead arsenate to 50 gallons of water. In America this arsenical—when used against "army worms"—was proved to be much superior to Paris green, and in every way more effective, the strength employed being 2 to 3 lb. lead arsenate in 50 gallons of water. The above proportion, however, applies practically to all caterpillars and cutworms devouring such crops as potatoes, tomatoes, &c. Home-made arsenate of lead can be made as follows:—Acetate of lead 22 oz., arsenate of soda 8 oz., water 50 gallons; dissolve the sugar of lead in 2 gallons of water in a wooden vessel; in another pail dissolve the arsenate of soda in about 1 gallon of water. Pour these two solutions together, and add sufficient water to make 50 gallons of spray material.

Care must be taken when using lead arsenate solution to keep it well stirred, in order to prevent the arsenic from settling, and so insure a uniform distribution of the poison.

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## A MINOR SUGARCANE PEST (*Plutorectis melanodes* M. and L.)

*Mr. R. W. Mungomery, Assistant Entomologist at Bundaberg, has submitted the following report for the period August to September,* 1928, *to the Director of the Bureau of Sugar Experiment Stations, Mr. H. T. Easterby:—*

During this period of the year it is not an uncommon sight to see hanging from the cane foliage, a tough felt-like case, and on the outer surface of this case are interwoven small pieces of dead sticks or cane trash. In addition, the foliage nearby may have conspicuous irregular gaps in it, similar to that caused

by grasshopper injury. This, really, is the result of the cane leaves having been eaten by a caterpillar which lives inside the case, and if the observer is possessed of sufficient patience, he will be rewarded by seeing the caterpillar project its head out from the top of the case for a distance of half an inch or more and commence gnawing away the leaf tissues or else moving from one spot to another. If the caterpillar be disturbed when thus occupied, it will suddenly withdraw its head and remain with the mouth of the case securely fastened until the would-be intruder has abandoned its attack. While the caterpillar is engaged in feeding or in crawling from leaf to leaf it always carries its case with it, and when it is on the point of moulting or pupating the top of the case is closed up, and it suspends itself by means of silken threads from some part of the cane plant, or from any other object near at hand. From this peculiar habit which the larva has of living within the case, this type of larva has earned for itself the name of "bag-worm." Less commonly it is sometimes referred to as a "basket-worm." Similar insects are frequently seen on rose bushes, fruit trees, and many of our native forest trees, and they all have much the same habits.

The species found damaging cane has been reared through to the adult stage, and has been identified by Dr. Jefferis Turner as *Plutorectis melanodes* M. and L., belonging to the family *Psychidæ*. This family of moths is of more than passing interest on account of the great difference of form exhibited between the male and female sexes. The male moth *P. melanodes* is a rather densely haired, buff-coloured insect, with feathery antennæ and wings of a dark smoky colour becoming lighter towards the tips. As soon as it has assumed the adult form, it escapes from the case which has protected it during its larval stage and flies away. The female, on the other hand, is incapable of flight and never leaves the case. In form it reverts more to the original larva and becomes quite maggot-like; in fact, it is totally unlike a moth in general appearance, and its whole body appears to be nothing less than a huge sac of eggs, and its one function is to perpetuate the species.

This insect must be classed as only a minor sugar-cane pest, and, therefore, is not looked on with any great disfavour by the average grower. In the first place these caterpillars are very slow feeders, eating a little at a time and sometimes refusing to eat for several days during the period prior to moulting, so that the ordinary growth of cane leaves more than counterbalances the small injury they inflict. They also require a much longer time to complete their life-cycle than the common Noctuid caterpillars which attack cane, and since they remain on the tall cane and assume the imaginal stage during the spring and summer months, most of them are destroyed when burning the trash previous to harvesting the crop, or by firing the trash after harvesting has been completed. Furthermore, although they live inside a case and are, for this reason, not so likely to be attacked by birds, &c., other insects such as Tachinid flies parasitise them, and probably other factors also operate unfavourably against them and serve to help keep them in check, and they have never become of sufficient consequence to warrant control measures being instituted against them.

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## ENTOMOLOGIST'S ADVICE TO CANEGROWERS.

By EDMUND JARVIS.

### Commencement of Monthly Hints.

The publication of this series of Entomological Notes was first started nearly five years ago (November, 1923) for the purpose of reminding our growers of their responsibilities with regard to the control of the various cane insects likely to be in evidence each month.

Concerted action undertaken at the right time might go far towards minimising the injuries caused by some of the more serious cane pests, and whilst not unduly trespassing on the daily work of the farm, would also benefit farmers financially.

The forms of control advocated in these Monthly Hints apply to those species of decided economic importance, occurring more or less commonly throughout the cane-fields of North Queensland.

### Price of Paradichlorobenzene.

At the present time this grub fumigant can be procured for £2 15s. per cwt. (98 per cent. purity); the minimum quantity supplied at this price being in 2-ton lots, delivered at main Queensland ports.

Growers wishing to obtain supplies for the coming season should lose no time in communicating with the secretary of the Cairns Cane Growers' Association, Theatre Buildings, Cairns.

### An Easy Way to Apply Paradichlorobenzene.

Cane grubs have been successfully fumigated with this chemical by means of a simple form of fertilising machine, in which it can be applied either alone or mixed with manure.

Very good results were obtained in this way last February on a couple of 2-acre plots of B 147, one of which was treated with crude paradichlorobenzene alone at the rate of 150 lb. per acre, and the other with about 75 lb. of this fumigant thoroughly mixed with an equal weight of manure.

The cane at the time of treatment was about 5 feet high, and the paradichlor. before being used was passed through a coarse sieve with ¼-inch meshes.

Any cane farmers interested in this matter should write to the Entomologist at Meringa (Private Bag, Cairns); or call at the Sugar Experiment Station, which is one of the rail motor stops on the Cairns to Aloomba branch.

### Invasion of Canefields by "Army Worms."

During the present season several outbreaks of this so-called "caterpillar plague" have been reported from widely separated localities. The species of moth responsible for such trouble—viz., *Cirphis unipuncta* Haw.—has often been described in previous Monthly Hints and Reports (see Bulletin No. 3, second edition, revised, pp. 35 to 39, Div. of Ent. of Bureau of Sug. Expt. Stats., 1927). An outbreak of this pest is seldom likely to prove serious unless the caterpillars should chance to be very numerous and about half an inch long, and are found attacking young shoots of ratoon and plant cane. In such cases the best poison spray to use is lead arsenate—2 lb. in about 50 gallons of water.

For fuller information the reader should refer to the writer's report for the period of August to September, 1928, which will be found in the October numbers of the "Queensland Agricultural Journal" and the "Australian Sugar Journal."

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## FIELD REPORTS.

*The Southern Field Officer, Mr. J. C. Murray, reports for the period from 14th August to 14th September:—*

### BUNDABERG.

### Weather and Crops.

Conditions generally are good, the crushing going along smoothly with a satisfactory output of sugar. Rain is looked for at present, the spring planting requiring about an inch to give it a good start. The weed growth should not be hard to deal with this spring. Noxious grasses and weed pests are all very dry, and chipping, combined with the scorching that trash fires will give, should make the farmers' tasks easier than last year, with its long crushing season and heavy rains.

It is estimated that 30 per cent. of the Bundaberg cane is arrowing. In some fields advance maturity is in evidence, with the arrows falling away and the top eyes shooting. This inability to maintain its erect arrowed condition for any length of time may be assisted by the gumming disease that is present. The c.c.s. of the cane in the district is high at present, but with the deterioration that follows early arrowing there is a probability of the high sugar content not being maintained throughout the season.

The big question of fertilisation calls for more attention in the Bundaberg district. With this matter is connected much of scientific investigation, but all that can be done in this way will fall to the ground without the co-operation of those most concerned—the growers. The virgin soil has been used up and we must supply humus, potash, nitrogen, and phosphoric acid in carefully considered quantities, and the way to obtain an intelligent idea of these quantities is for the grower of cane to experiment himself and not rely absolutely on the efficacy of the best advertised trade mixture.

Regarding the sub-areas in the Bundaberg district, conditions could be briefly described as under:—

**Woongarra.**

*Plant Cane.*—Made good growth, cutting expected tonnage, and satisfactory c.c.s.

*Ratoons.*—Not altogether satisfactory tonnage, but c.c.s. is good.

*Standover.*—In fair condition; satisfactory c.c.s.

*Spring Planting.*—Ground dry; coming up slowly.

*Autumn Planting.*—Has made slow growth up to date. A considerable amount of supplying had to be done. Wants rain.

*Soil Conditions.*—Farms well worked, although subsoil is very hard. Grubbing would improve.

*Varieties.*—N.G. 16, N.G. 15, H.Q. 285, D. 1135, M. 1900, Black Innes, H.Q. 77, Q. 813, Q. 855, and Malagache. There are a number of others on the farms, but the above are principally grown. N.G. 15 (Badila) second ratoons must be taken out this season, otherwise it will degenerate into gumming diseased rubbish. The farmers and planters are asked to give this their attention.

**Oakwood.**

*Plant Cane.*—Good growth and tonnage, especially in case of Q. 813; c.c.s. good.

*Ratoons.*—Tonnage not high; c.c.s. good.

*Standover.*—In fair condition.

*Young Plant Cane.*—Growing and striking well. Requires rain.

*Soil Conditions.*—The soil here is a light red scrub and forest loam. Drains and cultivates well. Would be improved if the growers could go deeper into the substrata.

*Varieties.*—Q. 813, Q. 812A, E.K. 2, E.K. 28, M. 1900 Seedling, H.Q. 285, and D. 1135. There are other varieties, but the above are principally grown.

**Clayton.**

*Plant Cane.*—Good growth. The tonnage and c.c.s. are satisfactory to the farmers.

*Ratoons.*—Tonnage not heavy, but c.c.s. high.

*Standover.*—This is in very good condition and should give satisfactory results.

*Young Plant Cane.*—This is growing well, but wants rain.

*Varieties.*—D. 1135, Q. 813, H.Q. 285, M. 1900 Seedling, and H.Q. 77. This is a fairly clean area, and would be reasonably safe for plants.

**Bullyard.**

The farmers here have a good showing of cane. The soil is, for the greater part, a light red forest loam, easy to work in that it is very level and accessible to cultivation. Cane varieties include Black Innes, M. 1900 Seedling, Malagache, H.Q. 285, H. 109, M. 89, H. 227, D. 1135, 7 R. 428, and Q. 813.

Growers are recommended to plant more Q. 813. In regard to this variety they are advised to avoid (*a*) cutting too early, (*b*) planting too shallow, and (*c*) carefully refrain from injuring the stools when ratooning.

Gumming disease is present in this area, therefore it is necessary for the growers prior to planting to carefully watch their plants and throw away any that show gum on the cut surface.

**If you like the "Journal," kindly bring it under the notice of your neighbours who are not already subscribers. To farmers it is free and the annual charge of one shilling is merely to cover postage for the twelve months.**

# RECORDS OF AUSTRALIAN THYSANOPTERA (THRIPS).

By A. A. GIRAULT, B.Sc., Entomological Branch.

## PART IV.

This is a continuation of the parts published in this Journal May and October, 1927, and June, 1928. The same arrangements have been followed. I am further indebted to Mr. C. T. White, the Government Botanist, as formerly, and also to the Queensland Museum for aid in reference to literature.

1. *Thrips tabaci* Lindeman.—From flowers, *Mesembryanthemum* again, Cheltenham, Victoria, May, 1928, F. E. Wilson, and at Hawthorn, Victoria, 11th December, 1927, R. Kelly; carnation, Glen Osmond, South Australia, 8th June, 1928, J. G. Bald (Waite Agricultural Research Institute); common in Shasta Daisy, Box Hill, Victoria, 27th January, 1928, R. Kelly; Azalea and *Beaumontia grandiflora*, Botanic Gardens, Brisbane, June, 1928, G. H. Hardy; on cabbage leaves in numbers, Cleveland, 27th June, 1928, J. A. Weddell; on onion, Glen Osmond, South Australia, 8th June, 1928, J. G. Bald (Waite Agricultural Research Institute).

Numerous specimens submitted of the latter were a distinct variety of a dark brown-black colour, contrasting with a few of the lighter coloured and typical specimens also present. There were no structural differences. These dark forms are no doubt the variety *pullus* Uzel already recorded from Australia by Bagnall.

This species proves so far to be the commonest and most widespread of the terebrant Thysanoptera. It more than holds its own, and occurs more frequently in material examined than any other species. As the material which passes through my hands is chance or random in its nature, the frequency of the occurrence of this species in it would seem to represent truly its real occurrence outside.

2. *Thrips imaginis* Bagnall.—Shasta Daisy, Box Hill, Victoria, 27th January, 1928, R. Kelly; by the same collector, on water weed, Wattle Park, Victoria, 29th December, 1927; flowers of *Mesembryanthemum* with *tabaci*, Hawthorn, Victoria, 11th December, 1927, R. Kelly.

3. *Pseudanophothrips achætus* Bagnall.—I have examined the cotype of this species (Mount Lofty, Adelaide, South Adelaide) through the kindness of Mr. R. Kelly of Melbourne and confirm the previous identifications. From plum blossoms, Stanthorpe, 3rd September, 1928, S. M. Watson.

4. *Physothrips Kellyanus* Bagnall.—Carnation, casual in a large population of No. 74, Glen Osmond, South Australia, 8th June, 1928, J. G. Bald (Waite Agricultural Research Institute); passion vine, Taringa, 26th August, 1928; plum, Stanthorpe, 3rd September, 1928, S. M. Watson.

6. *Physothrips brevicornis* Bagnall.—On *Mesembryanthemum*, Cheltenham, Victoria, May, 1928, F. Erasmus Wilson; by R. Kelly—*Hypochaeris radicata* again, Hawthorn (27th November, 1927, 22nd January, and in March, 1928) and Wattle Park (29th December,

1927), Victoria; Shasta Daisy, Box Hill, Victoria, 27th January, 1928; *Ranunculus hippaceus*, Healesville, Victoria, 9th October, 1927; on *Eucalyptus sideroxylon*, Bendigo, Victoria, 1st July, 1928, F. Erasmus Wilson—rare amongst numerous specimens of No. 8.

7. *Thrips lacteicorpus* Girault.—Plum, Stanthorpe, 3rd September, 1928, S. M. Watson.

8. *Isononeurothrips australis* Bagnall.—*Hypochæris radicata*, Lorne, Victoria, 14th January, 1928, R. Kelly; *Eucalyptus sideroxylon*, and rarely upon dead gum leaves, Bendigo, Victoria, 1st July, 1928, F. Erasmus Wilson; apricot (very abundant), Stanthorpe, 28th August, 1928, H. Jarvis (through Chief Entomologist).

This is a richly coloured species, the abdomen usually white, black above except marginally. The only male I have seen is much smaller, white as in *Thrips lacteicorpus*, the apex of the abdomen with a pair of elongate bristles directed caudad. It was with the Bendigo, Victoria, material recorded just above.

9. *Idolothrips marginatus* Haliday.—Many pairs from grass tussocks, Ringwood, Victoria, May, 1928, F. Erasmus Wilson; from dead gum leaves, all females, Bendigo, Victoria, 1st July, 1928, same collector.

11. *Desmothrips bagnalli* Karny.—Forest, Stanthorpe, 24th December, 1923, a female.

12. *Desmothrips tenuicornis* Bagnall.—This is the wrong name for this number. The species *propinquus* of Bagnall is correct. The species *tenuicornis*, I conclude from further study, is *australis*, which see (No. 56). The three species are very closely allied.

The third antennal segment may be entirely white.

13. This is *Pseudothrips* (*Glaucothrips*) *parvus* Bagnall which is a *Physothrips*. The name is *Physothrips parvus* (Bagnall). I have examined a cotype of *parvus* from Brandon, Queensland, 16th October, 1914, through Mr. R. Kelly of Melbourne.

19. *Chirtothrips* ought to be *Chirothrips*.

21. *Heliothrips hæmorrhoidalis* Bouché.—Many females from *Adiantum peruvianum*, Botanic Gardens, Brisbane, June, 1928, H. Tryon.

The species farther differs from *semiaureus* in having the projected part of anterior head with concave or scolloped sides instead of straight sides.

25. This is *Cryptothrips froudei* Girault and not *rhopaloides* Karny.

The head is one-third longer than wide, the postocular bristle is present (thought to be absent) and far down the side of the head, moderately long, exceeding the postlateral and about equal the anterolateral; the club is armed with many stout, elongate setæ along one side. Sense cones on antennals 3–4 more than two, some dorsal. The unusual position of the postocular is noteworthy, and was the cause of its being overlooked.

A male, Kingston, forest; and a female, Mount Larcom, 3rd February, 1924.

27. *Haristothrips xanthocnemis* Karny.—A male, forest, Taringa, 7th May, 1928.

35. *Thrips shakespearei* Girault.—See No. 77.

38. *Heliothrips bifasciipennis* Girault.—A female on under leaf surface of granadilla, Taringa, 19th August, 1928. Originally described from specimens which were injuring the fruit of the passion vine. In what is perhaps a teneral specimen (female) caught from a leaf of passion vine, Taringa, 26th August, 1928, the whole body was golden yellow margined with black from eye to apex penultimate abdominal segment. At first I did not recognise this specimen, so strikingly coloured was it.

39. *Plesiothrips perplexus* Beach.—A female, window, City of Brisbane (Department of Agriculture), 12th October, 1925, I. W. Helmsing.

The genus has so far been misplaced and belongs to the Chirothripinæ with *Limothrips*. Like the latter its sole species is a grain inhabitating one.

41. *Anaphothrips Keatsi* Girault.—From *Heterothrips* together with *A. dubius*.

42. The specific name is *clavipilus* not *clavispilus*.

44. *Haplothrips partifuscipennis* Girault is a naked name and has no standing in nomenclature. The species is *bituberculatus* Girault described in *Podothrips*, but since the characteristic of *Podothrips* does not pertain to this species which only bears two variable tubercles on the lower part of distal tibia (absent in the original specimen), I refer the species back to *Haplothrips*. The species is evidently a scavenger or a predator, and was described from the banana where it occurs rarely amongst the colonies of *Scirtothrips signipennis*. It is the black species with a red larva found at Gympie as the third species occurring on the banana plant. (See Bulletin No. 2, Division of Entomology and Plant Pathology, Department of Agriculture and Stock, Brisbane, June, 1925, page 10.) I have the following additional records:—

Taringa, forest, 7th May, 1928; crawling amongst Pink Wax scales (*Ceroplastes rubens*) on citrus, Gayndah, March, 1928; in Casuarina forest, Morningside, 23rd August, 1925.

47. *Haplothrips froggatti* Hood.—Occasional in plum blossoms, Stanthorpe, 3rd September, 1928, S. M. Watson.

51. *Haplothrips gowdeyi* Franklin.—On Azalea and Justicea, Botanic Gardens, Brisbane, G. H. Hardy; on *Cyperus alternifolius*, Mayne Junction, 5th May, 1928, A. R. Brimblecombe.

53. *Thrips fortis* Bagnall.—Two females collected by R. Kelly in flowers of *Cassinia aculeata*, South Australia, and also bearing the label *Thrips florum* Schmutz which does not occur in Australia. The identification is by Guy D. Morison of the British Museum. This identification agrees with my own, but as I pointed out previously there are 4-5 pairs of *strong* hind pronotal setæ all dark and increasing in size mesad. Differs from *lacteicornis*: Ocelli pallid, without pigmented crescents and distinctly more separated, lateral distant from median; antennals 4-7 all dark, the wings are dusky and the interocellar setæ are behind and away from median ocellus instead of being contiguous at sides. The species *seminiveus* aside from colour differs from *fortis* in lacking the cross-row of setæ on middle of sternites.

54. *Haplothrips nigroculex* Girault.—Shasta Daisy, Box Hill, Victoria, 27th January, 1928; and on *Acacia calamifolia*, Winiam, North-west Victoria, September, 1927. Both collected by R. Kelly.

In these specimens the postocular was a bit closer to the cheek than to the eye.

56. *Desmothrips australis* Bagnall.

*Desmothrips tenuicornis* Bagnall.

Antennal 3 may be all white and the species as is not very usual, vary considerably; this is so much the case that I consider the sole characteristic of *propinquus* to be the 8-jointed maxillary palpi. In both species the labial palpi vary from 3-4 joints and very likely the maxillary palpi are unstable. As the labial palpi vary, the genus is *Orothrips* which takes precedence.

Mr. R. Kelly, of Melbourne, has sent me the following specimens:—An apterous female on Goodenia, Clare, South Australia, 14th October, 1926; a female from *Acacia pycnantha*, Winiam, Victoria, September, 1927.

Antennals 3 and 4 vary in relative length.

Also the following material of a well marked variety (named *poultoni* by Kelly and as yet manuscript name only).

On *Antirrhinum*, Box Hill, Victoria, 26th February, 1928.

A male, Stock, Renmark, South Australia; roses, Box Hill, Victoria, 3rd November, 1927 (in this specimen antennals 3-4 were shorter than usual and equal, 3 dark at apex; a female); at the same place upon *Œnothera* and *Allyeum*, 24th and 26th February, 1928; *Prunus japonicus*, Box Hill, Victoria, 9th March, 1928.

62. *Thrips partirufus* Girault.—In the preceding records from bananas, unless specifically stated, the insect was on the stem or fruit. Differs markedly from *japonicus* (cotype) in colour of antennæ and abdomen. Occurs also in Sumatra and Fiji.

63. The reference in Part III. is to the stem and not to the flowers of the banana.

66. *Chirothrips atricorpus* Girault.—Taringa, forest, 25th April and 27th May, 1928.

67. *Adiaphorothrips shakespearella* Girault.—A female, Wowan, brigalow forest, 12th April, 1923.

68. *Cryptothrips tithonus* Girault.—Two females from galls, Fern Tree Gully, Victoria, March, 1918, G. H. Hardy.

69. *Heliothrips sculptilis* Hood.—A female sweeping grass in a weedy garden, Norman Park, 10th September, 1927. Originally described from Proserpine, North Queensland, and known but from the two places.

70. *Elaphrothrips apterus* Girault.—Five specimens taken from tussocks at Melton, Victoria, May, 1928, F. Erasmus Wilson.

This record extends the known range of this species from South Queensland to Victoria.

71. *Limothrips cerealium* Haliday.—A female in tussocks, Melton, Victoria, May, 1928, F. Erasmus Wilson.

Mr. R. Kelly first collected this European species in Australia and he has sent me what appears to be part of the original material, a pair taken from wheat at Sydenham, Victoria, 25th November, 1915. I have thus confirmed the identification which was made by Bagnall.

72. *Titanothrips portentosus* Karny.—This appears to be a species of *Adiaphorothrips*.

73. *Heliothrips quadrifasciatus* (Girault).—From *Sericothrips* which has not been discovered in Australia so far. Very close to No. 69 but the bands on the fore wing are different and here the distal 2 very stout, dark bristles on vein 2 are not equal but the proximal is distinctly weaker. No. 69 shows indications of having the long middle dark band divided in the only specimen I have seen.

74. *Parafrankliniella nigripes* Girault.—From carnation flowers, Glen Osmond, South Australia, 8th June, 1928, J. G. Bald and Geoff. Samuel (Waite Agricultural Research Institute); many specimens and larvæ.

The latter, when mature, are of an orange colour and the bristles of side and dorsal abdomen and of prothorax are elongate and capitate, those from apex of abdomen (4) elongate, curved and acute; legs, antennæ pale; from each of the last two segments of the composite fourth antennal on alternate sides, is a thorn-like sense cone.

The first stage pupa is also orange in colour, the antennæ filiform and dark, 3-5 long, equal; bristles as in the larva but the caudal margin of the penultimate segment of the abdomen bears four, stout, thorn-like setæ. The exterior angle of the mesothorax bears three elongate, capitate bristles set in a triangle of which the apical and cephalic bristle is distinctly shorter than the others.

The antennæ of the larvæ are often dusky.

The male is similar to the female (adults) but the abdomen bears three pairs of very stout, long apical bristles and is darker.

75. *Euoplothrips bagnalli* Hood.—Two macromerous females taken from galls on leaves of a jungle vine (*Piper* sp.), Gadgarra, June, 1928 (J. R. Dawson, through the Chief Entomologist). Segments 3 and 4 of the antenna nearly all yellow in these specimens, each slightly dusky at apex; basal ½ of 5 yellow. The femoral tooth is yellow. On the fore tibia at ventral apex there is a triangular tooth as in the Kladothripinæ.

A micromerous male from galls on *Smilax australis*, Cooroy, 11th July, 1928, W. A. T. Summerville, amongst a very large number of a species of *Cryptothrips* (as yet not identified). The two teeth of ventral fore tibia are closer together in this form, and the first not at middle but beyond middle.

76. *Cryptothrips milmani* Girault.—Two specimens, both jet and the second and third tarsi jet, forest, Taringa, May, 1928.

77. *Thrips aligherini* Girault.—See No. 35. The previous notes under that number in Parts I. and II. refer to this species excepting the first assertion in Part I.

78. *Trichothrips erinaceus* Karny.—This is a striking species in shape and my specimens have deeply infuscated wings. I would call the species a *Phlocothrips*. The following specimens:—Two females,

forest, Wynnum; another at Morningside, Casuarina forest, 23rd August, 1925.

Karny (*in litt*) has informed me that the wings of this species are "endarkened uniformly on the whole surface"; the colour of the wings is not given in the original description, and at first I was somewhat in doubt as to the above specimens.

79. *Phoxothrips giganteus* Girault.—Two females, type locality (Amamoor, jungle, 13th July, 1924). This sex has no armature whatsoever even on the fore tarsi and the fore femur is only slightly swollen. It is like the male in colour.

## RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF AUGUST, 1928, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING AUGUST, 1928 AND 1927, FOR COMPARISON.

| Divisions and Stations. | Average Rainfall. | | Total Rainfall. | | Divisions and Stations. | Average Rainfall. | | Total Rainfall. | |
|---|---|---|---|---|---|---|---|---|---|
| | Aug. | No. of Years' Records. | Aug., 1928. | Aug., 1927. | | Aug. | No. of Years' Records. | Aug., 1928. | Aug., 1927. |
| *North Coast.* | In. | | In. | In. | *South Coast*—continued: | In. | | In. | In. |
| Atherton ... ... | 0·83 | 27 | 1·08 | 0·12 | Nambour ... ... | 1·91 | 32 | 1·05 | 0·07 |
| Cairns ... ... | 1·76 | 46 | 0·59 | 0·15 | Nanango ... ... | 1·39 | 46 | 0 | 0·20 |
| Cardwell ... ... | 1·30 | 56 | 0·98 | 0·03 | Rockhampton ... | 1·00 | 41 | 0·05 | 0·72 |
| Cooktown ... ... | 1·32 | 52 | 0·02 | 0·35 | Woodford ... | 1·77 | 41 | 0·73 | 0·32 |
| Herberton ... ... | 0·66 | 41 | 0·12 | 0·07 | | | | | |
| Ingham ... ... | 1·53 | 36 | 0·67 | 0·23 | | | | | |
| Innisfail ... ... | 5·13 | 47 | 3·78 | 0·19 | *Darling Downs.* | | | | |
| Mossman ... ... | 1·36 | 15 | 0·14 | 0·10 | | | | | |
| Townsville ... ... | 0·54 | 57 | 0 | 0 | Dalby ... ... | 1·25 | 58 | 0 | 0·65 |
| | | | | | Emu Vale ... | 1·21 | 32 | 0·21 | 0·19 |
| | | | | | Jimbour ... ... | 1·24 | 40 | 0 | 0·15 |
| *Central Coast.* | | | | | Miles ... ... | 1·17 | 43 | 0 | 0·20 |
| | | | | | Stanthorpe ... | 1·85 | 55 | 0·37 | 0·33 |
| Ayr ... ... ... | 0·62 | 41 | 0 | 0 | Toowoomba ... | 1·72 | 56 | 0·90 | 0·45 |
| Bowen ... ... | 0·68 | 57 | 0 | 0 | Warwick ... ... | 1·55 | 63 | 0·23 | 0·19 |
| Charters Towers ... | 0·60 | 46 | 0 | 0 | | | | | |
| Mackay ... ... | 1·09 | 57 | 0·17 | 0·45 | | | | | |
| Proserpine ... ... | 1·42 | 25 | 0·70 | 0·05 | | | | | |
| St. Lawrence ... | 0·88 | 57 | 0·12 | 0·12 | *Maranoa.* | | | | |
| | | | | | Roma ... ... | 0·99 | 54 | 0 | 0·12 |
| *South Coast.* | | | | | | | | | |
| Biggenden ... ... | 1·10 | 29 | 0·35 | 0·53 | | | | | |
| Bundaberg ... ... | 1·32 | 45 | 0·25 | 1·22 | *State Farms, &c.* | | | | |
| Brisbane ... ... | 2·06 | 77 | 1·05 | 0·27 | | | | | |
| Caboolture ... ... | 0·57 | 41 | 0·98 | 0·20 | Bungeworgorai ... | 0·96 | 14 | 0 | 0·18 |
| Childers ... ... | 1·25 | 33 | 0·28 | 1·04 | Gatton College ... | 1·21 | 29 | 0·63 | 0·28 |
| Crohamhurst ... | 2·24 | 35 | 1·07 | 0·15 | Gindie ... ... | 0·74 | 29 | 0 | 0·07 |
| Esk ... ... ... | 1·56 | 41 | 0·70 | 0·30 | Hermitage ... | 1·37 | 22 | 0·35 | 0·22 |
| Gayndah ... ... | 1·20 | 57 | 0 | 0·60 | Kairi ... ... | 0·94 | 14 | 1·11 | 0 |
| Gympie ... ... | 1·78 | 58 | 0·49 | 1·42 | Sugar Experiment Station, Mackay | 0·98 | 31 | 0·5 | 0·18 |
| Kilkivan ... ... | 1·47 | 49 | 0·30 | 0·23 | | | | | |
| Maryborough ... | 1·70 | 56 | 0·42 | 0·86 | Warren ... ... | 0·91 | 14 | ... | 0·81 |

GEORGE G. BOND,
Divisional Meteorologist.

# PROGRESS OF AGRICULTURE IN QUEENSLAND.

By J. F. F. REID, Editor of Publications, Department of Agriculture and Stock.*

**Geographically, Queensland is in a position to supply economically the wants of the eastern mainland of Asia and the Pacific Islands. Coming to the personal equation, Queensland has always attracted the adventurous, and the strong and practical character of her pioneers is expressed in the development we see to-day—the evidence of a progress that constitutes one of the greatest epics in the history of British colonisation.**

In previous talks we have discussed in a very general way the progress of agriculture in other countries. Therefore, I think that it would be quite fitting to take a general survey of the primary industries in Queensland and consider what we have done ourselves in the way of developing agriculture.

## The Land of the Young Man.

Of all the practically undeveloped countries in the world to-day, Queensland, with its illimitable reservoir of latent wealth, is the land of the young man—the land of the future.

In climate we are particularly well blessed. Every known economic plant, requiring either temperate or torrid conditions, can be produced prolifically within our borders. The whole range of climate of the State embraces the winter snows on the southern uplands, the dry atmosphere of the western plains, and the summer humidity of our northern tropical areas.

No other country can claim the possession of richer pastoral, agricultural, and mineral resources. Ours is a vast country in a corner of which the British Isles would be lost. It is hard for many people to realise, for instance, that here in Brisbane we are actually nearer Melbourne than we are to Cooktown or Camooweal, and north of both centres we could go many miles further, particularly north of Cooktown up through the Cape York Peninsula, which to a vast majority of us is still an unknown land. And yet, the total population of the whole immense State is considerably less than that of the single city of Melbourne, and very much less than that of the city of Sydney.

In all the world to-day there is no country offering greater opportunity to the skill, will, and character of men. A wise and far-sighted railway policy has made impossible the folly of centralisation; natural ports have been made the outlet for the primary products of, in every instance, provinces as large as the State of Victoria. Each coastal city has its own railway system, and so well is the State endowed that behind each port are vast, undeveloped, or partly worked, coal measures which may be regarded as gilt-edged guarantees of a great industrial future.

## An Epic of Colonisation.

Geographically, Queensland is in a position to supply economically the wants of the eastern mainland of Asia and the Pacific Islands. Coming to the personal equation, Queensland has always attracted the adventurous, and the strong character of her pioneers is expressed in the development we see to-day—the evidence of a progress that constitutes one of the greatest epics in the history of British colonisation.

It was not until the early forties of last century that land settlement began to take definite shape. Pastoral occupations followed closely on discovery. The wealth of the Darling Downs, discovered by Allan Cunningham just a hundred years ago, attracted southern stockmen, and in the years that came after the drover followed the pathfinder, northward to natural cattle country, and westward the great open rolling Downs—our Mitchell grass country that to-day produces a nation's wealth in wool. Stock raising became the new colony's first great industry. In

* In an address delivered through the Queensland Government Radio Station, 4QG.

the first few years of settlement development proceeded rapidly. Rich virgin soils did not remain long untilled. Maize, sugar, and cotton were cultivated, but the pioneer's main interest was still centred in his flocks and herds.

The Darling Downs, a wonderful stretch of country comprising 16,000,000 acres, of which 4,000,000 are considered to be the most fertile black soil area in the world—Sir John Russell, the great English soil scientist, of the Rothamsted Institute, when in Queensland recently, was deeply impressed with its richness—was, however, soon to feel the tickle of the plough-share.

In 1840, Patrick Leslie formed the first Queensland stock station at Toolburra; and Warwick, the flourishing wheat land centre, and one of the important inland towns of Australia, now stands on the site of that pioneer pastoral settlement.

Plate 83.—Mr. J. F. F. Reid.

**The Romance of the Wool Industry.**

The romance of the wool industry is known to and appreciated by most of us, but it is interesting, sometimes, to look back along the road we have come and over the country we have traversed.

The early settlers soon found out that the lands on the sunset side of the main range were adapted to the growth of the finest merino wool—wool that, in successful competition with all other producing countries, has since, at times, reached the top price in the world's salerooms. In the early days of the industry merinos were the main stocks, but in 1869 an experimental cross was made with Leicesters. Its success was so decisive that cross-breeding became fairly general. Lincolns, Romney Marshes, Border Leicesters, Cotswolds, Shropshires, and South Downs were all tried, but the Lincoln-Merino cross was favoured more generally. With a ready wool market sheep country was quickly occupied. Settlement spread westwards and northwards to the far interior where, to-day, is grown probably the finest Merino wool in the world.

Artesian and sub-artesian wells solved to a large extent the water problems, and experience has shown us that Queensland is one of the healthiest countries for stock on the globe. Our western areas are singularly free from disease. Favourable conditions, combined with intelligent animal husbandry and scientific methods, go to make the base on which has been built Queensland's proud reputation of producing wool qualities as high—in some years higher—than those of any other State in the Commonwealth. Queensland scoured Merino has brought within a fraction of 64d. at the Brisbane sales.

### The Development of the Beef Industry.

Then there is the beef industry that developed from equally small beginnings, though its governing conditions have often been less stable. At the time of Separation in 1859, the Durham and Shorthorn were the only breeds represented on Queensland pastures. Since then, by systematic breeding with stock from the great cattle families of the old country, herds have been much improved, and other breeds, including Herefords and Polled Angus, have been introduced and now form a large proportion of our cattle population.

In the eighties the point of over-production was reached. The surplus went into the tallow casks at the boiling-down works. This wasteful process was superseded by freezing, and meatworks as we know them to-day were established at convenient ports and our frozen meat trade was born.

By a system of regulated purchase, treatment, and shipping, the industry was stabilised. More freezers were established, and an era of prosperity followed. Being subject, of course, to seasonal conditions, the fortunes of the industry varied. During the war the industry passed through its most prosperous period, but with the completion of Imperial contracts and the operation of certain economic and other causes, a slump set in. By herd improvement, scientific treatment of the product, regulated distribution, the regaining of old and opening of new markets, and a thorough system of organisation generally, a strong revival in the industry is anticipated. The high quality of Queensland beef has long been recognised in the world's markets. All this has nothing much to do with agriculture, you might say, but in the expansion of each industry in Queensland—the farming and the pastoral—conditions were very much the same; and with us, I think, they must always remain inter-related.

### Agriculture.

Coming now to agriculture particularly. In the early sixties cultivation was confined to the coast. Maize and other crops were grown on what is now the thickly-populated suburbs of Oxley, Bulimba, and Hawthorne, and in other near-city parts of the Greater Brisbane area. The Downs country was, as yet, practically a thinly peopled sheep walk. The total furrowed area within the State amounted at the most to less than 3,500 acres. Sugar, cotton, and wheat growing had not even emerged from the phantasy of a dream. On inward manifests, agricultural products were major entries. Our butter came from far-away Ireland, and most other products had to be imported also. Bananas were introduced and grown along the river banks.

Generally the Government of the day was not interested in the farmer, and the returns he got from his land would scarcely keep a ghost in fresh air. It was found convenient to sell him land at £1 an acre; that is, land that was looked upon as useless for sheep. The farmer came to be regarded as a necessary evil. Legislation was directed to the expansion of the pastoral industry, and agriculture was neglected. To the farmer was handed the meatless bone. Then came the American Civil War, and a consequent call for cotton to keep the wheels of Lancashire mills revolving. Queensland dreamt of cotton fields and cotton kings. A collapse followed. Farmers turned their attention to sugar, and Louis Hope grew the first crop on the red lands down at Cleveland.

From that small beginning grew the great sugar industry as we know it to-day—one of Australia's great land settling agencies with an annual value in hard cash of very many millions sterling.

### The White Man's Industry in a White Man's Land.

Queensland is the one country in the world to-day that grows sugar-cane successfully, and manufactures sugar by white labour and under white labour conditions. The industry pays £6,000,000 a year to white Australian workers; it is an important and most valuable factor in other industries employing an army of white Australians. More than 100,000 persons are dependent upon it, and it employs at least 20,000 people. The industry has an even greater national significance. When we think of

national defence a northern sugar-mill is as good as a brigade of infantry permanently garrisoned. The first Australian contingent despatched on overseas service in the great war went from northern cane districts, and through its agency the White Australia doctrine has advanced from an ideal to an actuality. In the maintenance of that actuality the defence of the Commonwealth is bound up with the preservation and progress of the Queensland sugar industry.

In 1871 there were only 9,581 acres under sugar-cane in Queensland. Development has been steady and continuous. To-day, 270,000 acres, in round figures, are cultivated for cane in this State.

**The Department of Agriculture and Stock.**

With a growing population and realisation of the extraordinary richness of our virgin soils, agriculture gradually came into its own, and the story of its further development is familiar to most of us.

The importance of the rapidly developing industry was appreciated by later legislators, and, on the 18th June, 1887, the Department of Agriculture was instituted by Proclamation. For the first three and a-half years it was under the control of the Minister for Lands. It then became subject to administration under a separate portfolio, with its present-day designation. The history of the Department is bound up in the more recent history of land settlement and rural development in Queensland.

In the course of its existence, it has had nineteen Ministerial heads, each with a progressive policy suited to the needs and demands of his day.

Each period has seen new and perplexing problems arise and departmental policy shaped accordingly, but, perhaps, the peak of complexity was reached in the immediate post-war years, from 1918 onwards. It was then that agriculture was confronted with the unpleasant phenomena arising from a lack of a complete system of ordered marketing and organised distribution. The need, not for nationalising, but for rationalising the industry and for wringing out the water from inflated capital values, became more and more apparent.

The longest term of Ministerial office was served by the late W. N. Gillies, who, like the late A. J. Thynne, left a deep impress on the fortunes of agriculture in this State. A farmer himself, and the son of a farmer, he brought to his office a sound practical training in land matters, a comradeship with the primary producer, a ready sympathy with him in his economic problems, and a wide, wise, and comprehending vision.

**Agricultural Legislation.**

As I have said, in the immediate post-war period, agriculture, not only in Queensland and Australia, but throughout the world, was faced with perplexing and unprecedented difficulties. So far as legislation could be applied to both cause and effect, it was applied in Queensland in a series of enactments that have aroused the interest, and often inspired the emulation, of authorities in other States and other countries. Queensland, a pioneer in industry and settlement and social improvement, became again a pioneer in agricultural legislation, and at the back of this were some very able and public-spirited Queenslanders, who supplied the dynamic force.

As a result of these activities, cotton-growing, practically non-existent, was raised to a promising industry. Systematic organisation of rural industry along co-operative lines was initiated. The Council of Agriculture, together with subsidiary organisations under farmer control, were established. The system of pooling of primary products was widely extended, and a fruit marketing system organised. Fodder and grain conservation schemes were brought into operation. The co-operative movement was strengthened; banana-growing was brought under strict white labour conditions, making it an entirely white man's industry. The stabilisation of the meat and dairying industries was advanced long stages nearer accomplishment. The Commonwealth Sugar Agreement was renewed. Sugar Cane Prices legislation was adjusted to make its operation more equitable to the growers. Advances to settlers were liberalised. The poultry industry was protected to the extent of minimising, as far as possible, the incidence of disease. A practical scheme for the improvement of draught farm horses was launched successfully. Protection was given to farmers and orchardists in relation to specifics for insect pest destruction. Bird and animal sanctuaries were increased in number and area. The scientific and technical branches of the Department were extended, and the system of departmental publicity made more comprehensive in respect particularly to the effective filming of Queensland at work in rural industry as part of a considered scheme of rural educational propaganda.

### Welfare of the Farmer.

Reverting to the general work of the Agricultural Department, which is as I have claimed, bound up inseparably with the progress of agriculture in Queensland, a restatement—or rather, a brief outline or survey of its services—may be appropriate at the moment. To the man on the land Agriculture and Stock is the most important of our administrative departments, and it is fair, I think, to say that there are few countries in the world where the welfare of the farmer is more the concern of efficient and experienced officers than in Queensland. In every phase of inland enterprise, guidance is freely given by men whose personal knowledge of local conditions in every district and practical experience are at the disposal of anyone embarking on a life on the land.

Through the Sugar Experiment Stations the canegrower has the benefit of scientific advice and field service on the farm in every branch of his calling. Cane varieties are tested under every-day conditions, and sets supplied to the farmer. Sugar-mills, on the boards of which growers are represented directly, have been established in every chief district. The price of the product is regulated equitably by Cane Prices Boards, and through them every interest concerned is assured of a fair and square deal.

In general agriculture the Department puts on its dungarees and goes out into the paddock, so to speak, to supply expert advice and field guidance through its State-wide organisation. Wheat and maize breeders are ever at work evolving new types to suit varying conditions in each grain-growing zone, particularly in the Maranoa.

Specialists and graders give the farmer every possible assistance in respect to cotton cultivation, and the whole available resources of science and the services of a highly trained corps of scientists are at the call of the agriculturist in Queensland.

### Dairying.

Queensland is the only country in the world in which dairying is conducted in the tropics successfully on a big scale. Ninety-eight per cent. of our butter production and 96 per cent. of our cheese output are produced co-operatively, under farmer control.

Dairy instructors and inspectors operating throughout the producing regions are well equipped with the knowledge necessary to assist and inform the dairyman in every way. The dairy farmer has the advantage of expert advice on all matters relating to his calling, from sowing and improving pastures, through every phase of animal husbandry, to manufacturing, right to landing his finished product in cold store or on the London and other overseas markets. Herd testing and breed improvement each claim practical attention and direction.

Pig and poultry raisers are provided for amply in respect to expert advice. In every fruitgrowing district field instruction in cultivation, in contending with insect and vegetable pests, in grading, packing, shipping, and marketing, in the cultivation and marketing of tropical fruits, is available.

### Classing Small Clips.

The service and advice of experienced veterinary surgeons are always available to any stockowner in difficulties or needing practical guidance in any way. Similar services are available in respect to sheep and wool. Clips up to 1,500 fleeces from any one holding are classed at nominal cost and prepared for the salesmen's catalogues. In this way the interests of the small flock owner are conserved and his clip presented to the buyer in the best marketable form.

### Science Service.

In agricultural chemistry the Queensland farmer is served by men most eminent in their profession, and who form the staff of probably the best equipped laboratory of its kind in Australia. A special branch of the Department devotes itself to the protection of the farmer in respect to ensuring that seeds, stock food, fertilisers, and specifics for pest destruction are kept up to prescribed grades and standards.

And so one might go on much further to detail the excellent public services that have been established by the Queensland Government and are being extended to meet every development in agricultural progress in this State.

And though we have not yet arrived at the time when we may spend the day sunning ourselves in the glory of our own achievements, Queensland has a record in agricultural progress of which we may well be proud.

# PRIMARY PRODUCERS' ORGANISATION.

## MINISTER'S SECOND-READING SPEECH ON AMENDING MEASURE.

**Queensland is a primary producing State with great resources awaiting development; and it is necessary that all social organisation and economic development must have as a starting point a sound and scientific agricultural policy.**—*Mr. Forgan Smith.*

The Primary Producers' Organisation and Marketing Act Amendment Bill was among the more important measures presented to Parliament this session. Subjoined is an abridged report, taken from "Hansard," of the second-reading speech of Mr. W. Forgan Smith, the Minister for Agriculture and Stock, who introduced the Bill, and which is of especial interest to farmers.

The Secretary for Agriculture (Hon. W. Forgan Smith, *Mackay*): The principal Act is a measure which endeavours to develop and extend the principle of co-operative marketing in Queensland. It deals with a subject of paramount interest to this and other States of the Commonwealth. At the present time every country is engaged in various forms of investigation with a view to developing forms of marketing which will organise agriculture on a better basis than hitherto with the object of making the life of the man on the land more attractive than it has been in the past. That is of particular importance to Queensland. We are a primary producing State with great resources awaiting development; and it is necessary that all social organisations and economic development must have as their starting point a sound agricultural policy, with a view to developing the latent resources of Queensland to provide a means of livelihood for a large section of our population; and also with a view to the general extension of the production of human needs on a more scientific basis than formerly.

My own personal view on this matter, and it is the view held by the Labour Party generally, is that this form of co-operative activity is the most significant and important factor in our social and economic life; and, according to the manner in which it is wisely developed and extended, so will the future prosperity of agriculture and agriculturists develop and extend in this State.

### Co-Operative Marketing.

Various forms of criticism have been directed against this form of organisation and marketing. Arguments are put forward in favour of a proposition that men trained only in the tilling of the soil are not, of necessity, the best men to control the marketing of their product. While there may be some truth at the present time in a general statement of that description, one must realise that co-operative development on the marketing side is a development which must extend with time, and this form of organisation will require to train men to carry out satisfactorily to themselves the duties which co-operative organisations impose on them. Everything must have a beginning. In older countries, where co-operative development in other avenues of activity is more extensive than is the case here, the same arguments were used against those associations at their initiation; yet we know that in various countries where co-operative associations have been formed millions of pounds of capital are now at their disposal. Those organisations have trained their own men in the control of industry, and these men can now compete on favourable terms with the captains of industry employed by private enterprise. So far as Queensland is concerned, we need have no misgivings in this respect. Co-operative activity has been an achieved success in this State; and in countless different ways production and distribution has been carried on by these organisations with benefit to their members and with credit to those placed in control. It is well known that the need usually produces the man. I am satisfied that, with this form of organisation and marketing becoming a permanent feature of the activities of the State, time will develop a class of individuals capable of rising to the responsibilities demanded of them, who will carry out their duties in a commendable way with benefit to the members and to the organisations they represent. Naturally, measures of this kind require extension and development as time goes on; experience teaches the need of extension in certain directions, and of modification in others. It is our desire to frame the legislation in such a way that co-operative organisations will have complete facilities for carrying out their work in the manner in which Parliament intended.

The Bill now before the House amends the principal Act of 1926, and deals with certain sections of the Fruit Marketing Organisation Acts, the Primary Producers' Co-operative Associations Acts, and the Wheat Pool Acts.

**The Pooling System.**

The first and most important amendment dealing with this measure is the majority required for the establishment of a pool. At the commencement of this legislation provision was made for a 75 per cent. majority, which was followed later by a two-thirds majority. With the knowledge and experience that producers have gained of the working of this Act, I am satisfied now that 60 per cent. is a satisfactory majority to initiate or carry on a pool. The idea of that majority is to ensure a sufficient volume of produce being supplied by a sufficient number of individuals to give the organisation a fair start. As one hon. member mentioned yesterday, if the margin was too narrow, there would be a tendency for the opposition to "white ant" the organisation before it was properly called into being. (Opposition laughter.) Hon. members may laugh at such a suggestion. We know, of course, that any change in the economic organisation of society involving a change in the exercise of economic power from one set of individuals to another evokes serious and strenuous opposition by the organisations which the new one is established to displace; they do not desire to have control taken out of their hands without a struggle being put up against it. As a matter of fact, the fruit-marketing organisations have found it necessary to exact a pledge from candidates for office in certain positions that they are not connected with agents in any other than a proper business way; in other words, that pledge is exacted to ensure that the nominees of agents are not secured for a purpose alien to the principles of the Act. However, be that as it may, I am satisfied that a 60 per cent. majority will be satisfactory in connection with all future pools.

For the continuance of the operation of existing pools, the Governor in Council will be given authority under this Bill to extend the life of the pool for a further period subject to ratification, if a vote is demanded by 10 per cent. of the growers affected. If 10 per cent. of the growers affected petition for a poll, a poll will be taken, and a simple majority only be required for the extension of the pool.

**The Initiation of Pools.**

In connection with ballots for the initiation of new pools, before any pool can be set in operation it will be necessary for a 50 per cent. effective vote of those known to be entitled to vote to be recorded before such initiation can take place. One can realise that it is sometimes difficult to compile a roll of those entitled to vote, because growers may change their crop from year to year, and a man who might be a voter one year may not be entitled to vote the next year.

The usual method adopted by the department is that those desiring to vote—and it is further extended under this Bill—must sign a satisfactory statutory declaration indicating that they belong to the class of grower defined in the Order in Council. Of the prepared roll under these conditions it will be necessary for a 50 per cent. poll of those entitled to vote to be recorded before a pool can take place.

**Pools in Operation.**

For the information of the House, I might give some idea of the scope of marketing control boards in this State.

The following figures for the year ended 30th June, 1926, show the value of the various commodities controlled by each commodity or marketing board—

| | £ |
|---|---|
| Sugar-cane | 6,354,625 |
| Butter | 5,079,857 |
| Fruit | 1,454,304 |
| Cheese | 582,522 |
| Wheat | 534,483 |
| Cotton | 379,331 |
| Eggs | 248,032 |
| Atherton maize | 78,500 |
| Arrowroot | 23,526 |
| Atherton pig | 16,200 |
| Canary seed | 9,390 |
| Peanuts | 8,566 |
| Broom millet | 1,600 |
| Total value | £14,770,936 |

Those figures indicate that a very large volume of agricultural production of Queensland is controlled by marketing boards exercising powers conferred on them by legislation passed in this Parliament. The value of agricultural production of

the State, including dairying, poultry, and bee farming, for the year ended June, 1926, amounted to £18,932,840. Of this amount, agricultural products to the value of £14,770,936, or 78 per cent., were under the control of commodity or marketing boards. The general policy has been uniformly successful from the inception. There is no single case of any marketing board having been unsuccessful in its operation, and all have been maintained on a sound financial basis. From time to time the Government have either made advances of credits to those boards or have guaranteed credits. In other cases financial institutions, without any guarantee from the Government at all, have provided them with the necessary fluid capital to carry on their operations. In every case these marketing boards have met their obligations, and not one penny of Government guarantee has been called up. All that indicates a very healthy state of affairs with regard to this form of policy, and justifies the Government in continuing this line of activity.

**Favoured by Producers.**

Further tangible evidence of the confidence of the producers in the pooling system is the fact that, when votes have been taken on the question of the continuance or otherwise of an existing pool, an increasing percentage is invariably noted in the number of producers for the carrying on of the pool concerned. For example, the various pools now operating have been adopted on the following majorities:—

Arrowroot, established in 1922 without any opposition.

Atherton Maize, established in 1923 without any opposition.

Northern Pig, established in 1923 without any opposition; renewed in 1926 without any opposition.

Broom Millet, established in 1926 without any opposition.

Butter, established in 1925 by a 75 per cent. majority; renewed in 1928 without any opposition.

Canary Seed, established in 1925 by a 75 per cent. majority; renewed in 1928 without any opposition.

Cheese, established in 1922 by a 91 per cent. majority; renewed in 1925 without any opposition; renewed in 1927 without any opposition.

Cotton, established in 1926 without any opposition.

Eggs, established in 1923 by an 87 per cent. majority; established in 1925 by a 73 per cent. majority; renewed in 1926 by a 66⅔ per cent. majority.

That indicates a falling off in the percentages of those in favour of pooling, which is often due to a greater number of poultry farmers being brought within the ambit of the pool—

Peanuts, established in 1924 without any opposition; renewed in 1925 without any opposition; renewed in 1926 by a 90 per cent. majority.

Stanthorpe Tomatoes (superseded by Committee of Direction), established in 1922 by a 78 per cent. majority.

Wheat (under the Wheat Pool Act), established in 1921 by a 97½ per cent. majority; extended in 1924 by an 89 per cent. majority; extended in 1928 without any effective opposition.

When the life of an existing pool now expires, the action taken is practically to start a new pool. The amending Bill proposes to give the Governor in Council power to extend the life of an expiring pool. The provisions regarding the petition for a vote are the same as apply to the initiation, with the exception that the life of an existing pool can be carried on for a further period of years by a simple majority.

**Safeguarding Ballots.**

In regard to the taking of the ballot, further provisions are contained in this Bill to see that the ballot is taken in a proper manner and is representative of all interests concerned. The practice now is for the producer to claim and record his vote in the one operation. The amending Bill will enable regulations to be issued requiring the claimant for a vote to give a statutory declaration, witnessed by a responsible person, that he is eligible to vote. This will enable the returning officer to require those claiming votes to give a similar declaration to that now given by persons applying for an electoral vote. For instance, in the case of a petition to protest against the extension of the Committee of Direction, the present legislation is rather indefinite as to what constitutes a commercial fruitgrower, interested or otherwise in the future of the Committee of Direction.

Mr. Moore: No declaration would be necessary under this Bill, because the pool would have the name of every producer.

The Secretary for Agriculture: In connection with the poll for the renewal of a pool the roll would comprise those who were in the pool the previous season. Those who have in other cases actually a crop under cultivation may be brought under the scope of a new pool. It is quite reasonable and just that that should be so. For example, a man may become interested in wheatgrowing for the first time. He may have a considerable acreage of wheat planted. It would be grossly unfair for that new grower to be debarred from a vote for the creation of a pool that might affect him for the succeeding five years in succession to the present one. Every provision that human ingenuity can devise is made in this Bill and the principal Act to secure to the grower those rights which are given to him and to see that effect is given to the principles which I have enunciated.

**Intimidation Illegal.**

As I explained yesterday, another provision in the Bill deals with attempts to intimidate or coerce farmers voting under the Bill. It is proposed to make it a criminal offence to attempt to intimidate a producer in the exercise of the franchise at a ballot for the constitution of a pool board. The Bill provides for a penalty of a fine of £200 or imprisonment for one year in respect of an offence of this nature. The provisions of the clause are the same as those which have been in the Criminal Code since 1899. No interference will be made with stating the case either for or against a pool. The Bill deals only with corrupt practices in a similar way to the Criminal Code in respect of general elections for Parliament. It will be an offence for a man to use economic intimidation against a farmer with a view to diverting a vote in one or the other direction. The principle underlying this provision is this: By this measure the farmer has machinery given to him whereby he can control his own industry, so that by co-operative means for improvements in marketing conditions he may attain for himself everything that he deems in his interests. Therefore, it is entirely a matter for the farmer himself to decide whether he will come under such an arrangement or not. As a Government we do not say that the farmer shall adopt this method of organisation. We say that we believe that this form of organisation, used properly and managed efficiently, will improve the conditions of the farmer, or, at any rate, will give him the opportunity to improve his conditions.

The defence put up yesterday by the Leader of the Opposition, that a storekeeper had the right to protect his own interests, has no real bearing on this question at all. A storekeeper conducts his business in the ordinary way. He sells goods to a farmer at a price which he fixes, and, included in which are his overhead charges and his margin of profit. Can it be seriously suggested that not only does the farmer owe him the amount due for the goods he has purchased but that the farmer is also under an obligation to sell to that storekeeper his own produce at any price fixed by the latter? If there is anything at all in the case put forward by the Leader of the Opposition, that is the logic of it. (Opposition dissent.) In other words, his contention yesterday meant that, if a storekeeper gives credit to a farmer, he has the right to say to that farmer, "You must do all your business through me at prices and under conditions which I dictate." (Opposition dissent.) All that the storekeeper has any right to get is the payment of the amount that is legally due by the farmer, the latter being left with the opportunity to sell his goods in the best market obtainable for them.

The suggestion was also made that, if a pool was formed, the farmer would be able to repudiate his obligations.

**Better Prices for the Grower.**

No one knows better than the Deputy Leader of the Opposition that that is not the case. Pooling usually results in better prices being obtained by the grower, and more advantages accruing to him financially; and he is in a better position to meet his liabilities than formerly. All money held by a pool board or a sugar-mill can be distrained on behalf of a creditor. Therefore, instead of the business of a storekeeper being affected by a measure of this kind, the business is conducted in a legitimate way, whereby the farmer, by improved organisation secures the better price for his product, and is in a better position to meet his liabilities than hitherto. . . . Everyone realises that there are certain economic interests operating in the community, and I understand that hon. members opposite have been placed in great difficulty, when claiming to be representative of country interests, when economic interests are pulling them in other directions.

I also wish to refer to the fact that under this Bill provision is made for two or more pools to be amalgamated or for the subdivision of an existing pool. Under the

Companies Acts, complete provisions exist for amalgamations, absorptions, subdivisions, reconstructions, and the like. This Bill contemplates similar machinery for the primary producers. Amalgamations will be subject to the right of the growers to have a referendum, which will be carried if 50 per cent. or more vote for the amalgamation.

With regard to pool boards which may have been in operation for some years, provision is made for the appointment by the Supreme Court of a liquidator for the winding-up of the affairs of such an organisation if it goes out of existence. The same provisions apply with regard to that as would apply to co-operative associations registered under the Primary Producers' Co-operative Association Act, or to a company registered under the Companies Act. This provision deals with a question such as this, which often arises: A pool board having built up certain assets, how shall those assets be disposed of in the event of the pool not being continued? There is power under this Bill for such a board to be put into liquidation and a liquidator appointed by the Supreme Court in the same manner as a liquidator is appointed under similar circumstances in connection with a company.

**Building up Reserves.**

A further important provision in this Bill is that relating to the building up of reserves. At the present time pool boards have authority, with the approval of the Secretary for Agriculture, to levy for administrative purposes or for insurance or other special objects of benefit to the growers. This Bill gives further provisions and powers with regard to the building up of reserves. I regard this as a very important phase of this legislation. I said at the beginning of my speech that, if this method of organisation is going to be a permanent feature, as I hope it will be, of the economic organisation of this State, it is desirable and necessary that reserves be built up and the finances of the boards controlled in such a way that they will be independent, financially and otherwise, of any Government that may be in existence. In other words, we want to build up these co-operative organisations in such a way that, by virtue of their own assets, their own business acumen, and the resources they control, they will be able to arrange for the necessary finance without having to undergo any disability or make any appeal to any existing organisation. Further, a wider power is given under the Bill to establish reserves. For example, it may be desirable for a board to establish a reserve fund with a view to providing for certain benefits to the industry as a whole, and, perhaps, financing seed for an ensuing crop; and in countless different ways advantages can be gained by the building up of reserves in the manner I have suggested. It is quite unnecessary for me to dilate at any greater length on that matter. Everyone realises that a sound business concern carefully builds up reserves in good years to enable it to tide over difficulties in a bad year.

A further provision in the Bill deals with Mossman, and creates it a separate district in the organisation dealing with the sugar industry. The Queensland Cane Growers' Council have asked for this, and the Mossman people, supported by the hon. member for Cook, in which electorate Mossman is situated, have been continually urging that this should be done. Mossman is a self-contained district, isolated to some extent from other portions of the State, and the people there desire an organisation of their own, and they will be given an opportunity under this Bill to have it.

**Commodity Board Majorities.**

The Bill also amends the Fruit Marketing Organisation Acts and gives the Committee of Direction power to raise money on the security of the fruit. It provides that the majority in a referendum shall be reduced from two thirds to three-fifths to bring the Committee of Direction into line with other commodity boards. As from 1st January, 1930, subject to the right of 500 growers demanding a poll, they will be given a further lease of activity under this Bill. At the present time they continue until 1st January, 1930. That power was extended by Order in Council for a period prescribed in the principal Act. No petition was received to enable a poll being taken, therefore the Committee of Direction of Fruit Marketing was continued for a further period. This Bill provides for a further five years after 1930, subject to a poll being demanded by 500 growers or the equivalent of 10 per cent. of the organised fruitgrowers affected by this organisation.

**Fruit Marketing.**

The Bill also deals with the provision relating to fruit barrows. In the principal Act the Committee of Direction is empowered to license fruit barrows and impose a license fee. That power is being deleted from the principal Act, and authority will

now vest with the Home Department to set up regulations for their control, having regard to the proper control of traffic within city or urban areas generally.

It is not intended to exclude fruit barrows from the streets entirely. It is recognised in almost every large centre of population that they constitute a method of trading which enables the people to get fruit at a reasonable price. They, therefore, supply a legitimate service. The Bill simply removes the control from the Committee of Direction, and enables the Home Department to bring into being machinery for the effective and proper control of the barrows, having regard to the traffic interests of city and urban populations.

The Bill also limits the number of members of a sectional group committee to a maximum of ten. As at present constituted, these committees number—

| | |
|---|---|
| Banana | 23 |
| Pineapple | 16 |
| Citrus | 9 |
| Deciduous | 9 |
| Other fruits | 12 |

The reduction in numbers of sectional group committees will not become operative until the terms of office of the existing committees expire in August next. This limitation is in accordance with the principle obtaining in the organisation of sugar-growers, mill suppliers' committees being limited to not more than ten members, who have been found sufficient to carry on the business effectively and efficiently. I have no belief in large committees, and I have been satisfied that representative committees of not more than ten can be established and worked efficiently.

**Committee of Direction.**

A further provision deals with the power to take and conduct a ballot as to the advisableness of continuing the Committee of Direction with a view to bringing it under the Primary Producers' Organisation Act. This is a similar provision to that in the Wheat Pool Act, and leaves the initiative and control to the growers themselves. If they desire it, the fruitgrowers can apply under this measure to constitute a marketing board under the Primary Producers Organisation Act, and, on the taking of a vote in the affirmative, the Committee of Direction would go out of existence and a marketing board be formed.

**Co-operative Associations.**

A further provision deals with the acquisition by co-operative associations of the assets of companies registered under the Companies Acts and in liquidation. Under the Companies Acts it is provided that a company so registered may sell to a company under conditions set out in the order of the court. Under those Acts a co-operative association is not a company; but this proposed amendment of the Primary Producers' Co-operative Associations Act will enable such associations to acquire the assets of a limited liability company in a manner satisfactory to both. The converse, however, will not apply, for obvious reasons.

**Co-operative Control.**

The tendency in agricultural organisation is in the direction of co-operative control. In the dairying industry, for example, 98 per cent. of our butter and 95 per cent. of our cheese is manufactured by co-operative concerns; but, as the law now stands, companies of a proprietary character, such as those registered under the Companies Acts, would not, upon liquidation, be authorised or, at any rate, would have some difficulty in disposing of their assets to a company to be formed under the Primary Producers' Co-operative Associations Act. The Bill proposes to remove that disability, and, therefore, makes provision for an extension of co-operative activity in that direction.

**Wheat Board.**

The next series of amendments deals with properties acquired by the Wheat Board, which, by means of loans from this Government, has built a number of grain sheds and acquired others in various situations for the effective handling of its crop. In addition, the Government purchased for a considerable sum of money the property in Toowoomba known as "The Maltings." This Bill provides that, when the amount of the indebtedness due to the Government is liquidated by the Wheat Board, the titles to these assets will be handed over to the board—titles equivalent to those which were purchased on its behalf.

In connection with the buildings on lands held by the Railway Department, the Commissioner for Railways will be authorised to issue leases under conditions satisfactory to both interests concerned. With regard to property of freehold character acquired, the title will be equal to that which was purchased, and will be given to the Wheat Board on the paying off of all their indebtedness.

Power is also given, with the permission of the Treasurer, to dispose of some of the assets of the board, provided that moneys so accruing shall be paid to the Treasury in liquidation of their debt. That I consider to be a fair and reasonable proposition. It increases the financial stability, and enables existing boards to build up real assets, which give a definite form of security enabling them to obtain advances from time to time for carrying on their operations.

### Farmers to Control their Own Business.

I think I have outlined the main provisions of this Bill. I have endeavoured to show to the House the necessity for the amendments we are placing before it. I am satisfied that, when this Bill becomes law, it will facilitate to a considerable extent the principle and management of co-operative organisations in this State. It will give the farmers a further opportunity to control their industries in a manner beneficial to them. It must be remembered, however, that in dealing with co-operative organisation the words "co-operative" or "organisation" of themselves do not confer any benefit. For any benefit to be conferred by a new form of organisation it must be more efficient than the form of organisation which it seeks to displace.

### To Reduce Costs of Production.

Co-operative organisation wisely managed and efficiently controlled, by eliminating waste in various directions, can reduce costs and enable a greater return to accrue to the farmer. By well-devised and orderly marketing gluts can be prevented, depressions guarded against; and in countless different ways orderly marketing or orderly supply of goods to a market can be of benefit to all concerned. Why should the farmer be the only individual who has no control over the marketing of his own produce? Almost every other form of human activity that produces has some foreknowledge of the marketing conditions. The demand that there will be for a given product in a given market at a given time can be estimated with a degree of accuracy; and organisation can be so effected as to supply that market regularly with a view to preventing low prices and panic from time to time.

### Organisation and Orderly Control.

These are the days of organisation and orderly control; and, if that organisation and control are carried out in a manner not detrimental to the public interest, it will be of distinct benefit to society. Most of the difficulties in the world at the present time are due to bad organisation in production and distribution. Where production exceeds consumption under a given form of organisation, various periods of trade depression take place with resultant difficulties to all concerned. With modern methods and machinery, the productive power of mankind in industry has increased enormously. Production can be carried on with greater rapidity than consumption can overtake it; and, as a result, you have a cycle of recurring trade depressions taking place within a narrow ambit of social organisation. Therefore, the remedy is the orderly marketing and orderly control of industry with a view to estimating and supplying human needs.

### Better Conditions for the Farmer.

Orderly marketing by a scientific organisation, which can be established under this Bill, will enable the farmers, provided they use it properly, to obtain better conditions for themselves, and by those better conditions better organisation improving the conditions of the great bulk of the people generally, and thus be of benefit to the people as a whole. Gluts are no good to the farmers. They mean that, when he has large crops, either through bad organisation or bad marketing, he gets a very small price, and on some occasions no price worth while at all. In other cases when prices are high he has little or no produce to sell. Those methods are bad both for the farmer and for the people who use his produce. Of course, climatic conditions cannot be completely controlled; but I am satisfied that, with the application of proper methods, under a measure of this kind, many of the difficulties can be removed. If, therefore, this Bill is a further step in this direction, then we in this Parliament will have done something worth while, and something which will be of benefit not only to the people concerned but to the State as a whole. I therefore have much pleasure in moving—

"That the Bill be now read a second time."

# QUEENSLAND PRODUCERS' ASSOCIATION.

## A YEAR OF EXPERIENCE.

"WE have had a year of experience in working the organisation on a commodity basis. I have watched the work of the various organisations during the past year, and am quite satisfied, speaking generally, that progress has been made, and the legislation of 1926 has been fully justified."

The foregoing remarks were made by the retiring president (Mr. W. Forgan Smith, Minister for Agriculture) at the last annual meeting of the Council of Agriculture and conference of delegates of the Queensland Producers' Association. The organisation of the farming industry and of the marketing of the farmers' produce was a problem difficult for any Government or Parliament to solve, he continued, for so many varied interests were involved, and so many commodities were subject to different economic conditions. To set up an organisation such as the Queensland Producers' Association it was necessary to carefully observe all the progress that was made, and adapt the organisation in accordance with the experience gained. In other words, the success of co-operative organisation among the farmers was a matter of gradual progress. "I think it can be said," added the Minister, "that in view of the work of the organisation in this State you can only come to the one conclusion, and that is that it has been completely justified, and that it has marked the beginning of a new era for the man engaged in primary production.

### Commonwealth Organisation.

During the past year you have had to encounter many difficulties that are incidental to your work, and I am satisfied that the commodity boards have carried out their duties satisfactorily, and in a manner that has been of advantage to the people they represent. In the course of the year there was a conference on the question of the establishment of a Commonwealth organisation. In that connection I note with pleasure that Mr. McRobert, one of your representatives, was called upon to be chairman. I regard that as a distinct compliment to the farmers in Queensland. I look forward to the time when producers' interests throughout Australia will be organised on a Commonwealth basis, with the producers themselves co-operatively controlling the industry, improving conditions generally, and in that way building up the wealth and resources of the Commonwealth of Australia." In dealing with the future, Mr. Smith indicated to the meeting certain amendments he proposed to bring forward with regard to "*The Primary Producers' Organisation and Marketing Act of* 1926," the Fruit Marketing Act, and the Stock Foods Act. The proposals outlined were unanimously endorsed.

### A Review.

The annual report of the executive committee, after outlining its work in connection with the farm workers' award, the Marketing Act, and the Australian-wide organisation, reviewed the position generally. The report stated that the committee was in a position to indicate that it had kept well wtihin the vote provided at the last annual meeting, namely, £6,000. The actual expenditure in accordance with the budget indicated was only a little over £4,000. The committee urged that no cognisance should be taken of those enemies of farmer organisations who stated that the various branches were not meeting as frequently as was the case in earlier years, and were not being as well attended. There was a very sound reason for this, in that when the organisation first commenced to function only two industries were organised at the marketing end. At the present time every important agricultural industry in the State was organised at the marketing end with the exception of maize, pigs, and fodder. In these circumstances, there was not the same necessity for the active functioning of the branches. The branches, nevertheless, remained, and when occasion demanded, as experience showed, they could be speedily galvanised into life. The committee in this regard had in view proposals having for their objective the holding of periodical public meetings of farmers in the more important country centres, at which instructional lectures would be given. The committee submitted a budget for the ensuing twelve months, amounting to £6,000, and suggested the precepting of the various boards on the same lines as last year.

After debate the report and recommendations were adopted unanimously, and the president, to whom appreciative reference was made, was accorded a vote of thanks.

The election of officers resulted:—Chairman, Mr. W. Forgan Smith (Minister for Agriculture); vice-chairman, Mr. James McRobert; executive committee, Messrs. H. T. Anderson, J. Archibald, J. McRobert, and W. J. Sloan.

Several speakers, including Messrs. J. McRobert (Butter Board), A. S. Douglas (Wide Bay), W. L. Osborne (South Burnett), in congratulating Mr. Forgan Smith upon his re-election, expressed appreciation and approval of his able and effective work on behalf of the rural industries, commending the fact that he had at no time exhibited political partisanship, but had worked in the best interests of Queensland.

Mr. Chris. Sheehy, formerly of the Department of Agriculture and Stock, is the very capable secretary of the organisation, and in that office he has given and continues to give very valuable service to the farmers of Queensland.

## LAMB MARKING PRECAUTIONS.

With the period for lamb marking impending, it is well to keep in mind an aspect of the operation, neglect of which is every year the cause of appreciable loss.

Each season during the period in which lambs are subjected to the operation of marking, reports are received of deaths closely following, and investigation has shown that this mortality is due in the majority of cases to one or another of certain inoculable diseases (notably tetanus and blood-poisoning), the germs of which have entered the system of the animal through the wounds.

In order to prevent mortality caused by tailing, &c., it is necessary to prevent this wound infection. It is certain that in most cases the contagion is present in the sheep yards, and is consequently extremely difficult to get rid of. Experiment has shown that a solution of the earth from the surface of a yard may be so full of disease organisms as to be fatal to two out of four animals inoculated with it. In view of this, and the knowledge that various micro-organisms may remain alive for years in the soil, certain protective measures are highly imperative.

When marking small flocks, it is best to use temporary yards made of movable hurdles situated in a fresh paddock. With large flocks this is perhaps impracticable, and the following treatment of the yards is recommended: Remove the surface soil of the yards to a depth of about 6 inches, and place it in a heap, where it should be thoroughly mixed with quicklime. Then saturate the fresh surface exposed with a strong solution of non-poisonous sheep dip.

In addition to the above precautionary measure it is essential to adopt some means of preventing the germs of disease from gaining entrance into the flesh-cuts made in the scrotum and tail. As the yards, although the main, are not the only source of infection, it is recommended that wounds of the scrotum and tail be either smeared with tar or dressed with carbolised oil (1 part of carbolic acid to 12 parts of oil) before the lamb is released after the operation. This is most important.

Knives used for docking and tailing should be boiled, and not allowed to come in contact with the ground during use.

Lambs dead of the diseases, if not destroyed, form fresh centres of infection by absorption of the micro-organism by the earth. All carcases should therefore be destroyed by burning. Finally, if measures are not taken to prevent these diseases, the losses, in addition to occurring annually, will show a tendency to increase in extent by reason of the increased soil contamination.

The operations of ear-marking and tailing, together with the castration of the male lambs, are usually carried out at the same period, generally when the lambs are between three and six weeks old. There is considerable diversity of opinion among sheep-breeders as to the most suitable age for performing these operations, some claiming that at a fortnight old there is least risk to the animal through loss of blood, while others prefer a later age, even up to three months, claiming that the lamb has then grown sufficiently to withstand the check. In cold districts and severe seasons, the additional warmth and protection afforded the hindquarters is a reasonable argument for delay, but under average conditions it is generally conceded that from three to six weeks is the safest age for tailing and castration. Where the lambing season is protracted there will naturally be considerable difference between the ages of the lambs dropped first and those dropped last, and it may be necessary to mark the drop in two portions with an interval of a month between.

The sheep should be mustered some time before, and the lambs allowed to settle down before the operations commence. There should be no rushing about, and dogs should be used as little as possible, as deaths from hemorrhage are very common when lambs are marked in an excited and overheated condition. Both sexes may be treated at the same time, and a useful check will be obtained of the numbers and sexes marked if the tails of the male and female lambs are thrown into separate heaps.—"A. & P." Notes, N.S.W., Dept. Ag.

# DAIRYING IN QUEENSLAND.

**The Minister for Agriculture and Stock (the Hon. W. Forgan Smith) announced last year the appointment of a Departmental Committee to make a survey of economic facts relating to some important phases of agriculture in Queensland.**

**The Committee has met from time to time and has collected and collated much useful data. The Minister has previously announced his intention of conveying some conclusions based upon this data to producers through a series of Bulletins.**

**In the first Bulletin the present conditions in the industry in Queensland were reviewed briefly. In the second Bulletin three outstanding factors were elucidated and stressed, namely:—The need of herd improvement; the importance of feeding; and the necessity of herd testing.**

**In this (the third Bulletin) the points briefly considered are stock foods and the manufacture and marketing of dairy products.**

**This Bulletin not only sets these forth as meriting the immediate attention of those engaged in the industry, but also extends a standing invitation to dairymen to avail themselves of the helping hand of the Department and of the facilities which it offers.**

The dairying industry in Queensland is conducted on strictly co-operative lines. The shareholders in a Co-operative Dairy Company Association are suppliers of milk or cream to factories and through their elective board control their company's undertakings.

The managerial objective is to profitably manufacture the highest quality product and so market it that the producer will receive the highest possible return for his milk or cream on a quantity and quality basis. The payment of dividends on shares held by suppliers is restricted to an interest charge of 5 per cent.; no profits are distributed to shareholders in the form of dividends.

**Queensland is the only country in the world in which dairying is carried on successfully, and on a large scale within the tropics.**

The capital invested in dairy factories totals approximately £35,000,000, while individual factories representing a capital value of from £30,000 to £60,000 are operating in the old-established dairy districts. Most of the butter factories are constructed of concrete or brick and are modern in design and equipment.

The provisions of the Dairy Produce Act of 1920 safeguard and promote all interests in the industry. Inspectors see to the maintenance of high standards of hygiene; and processes of manufacture are carried

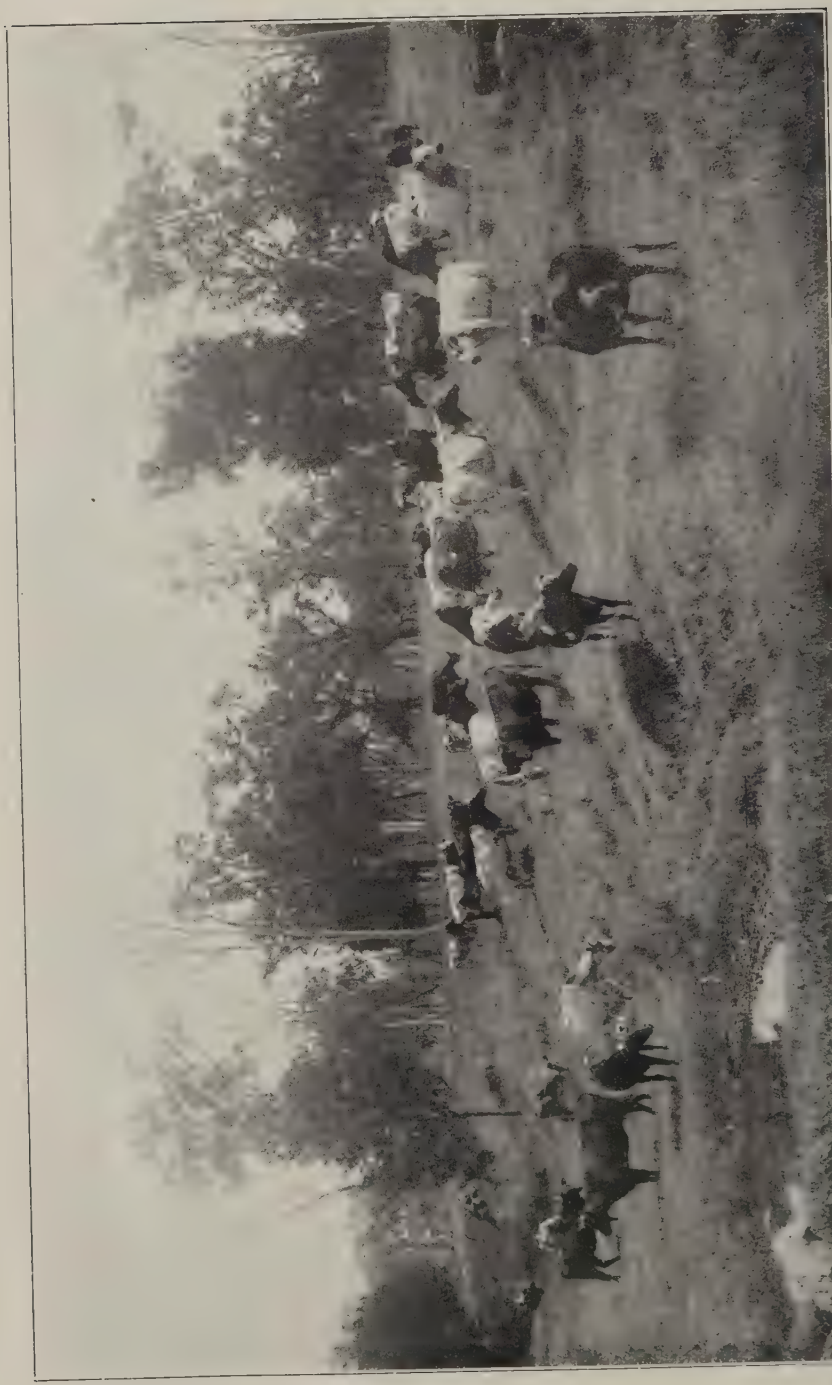

PLATE 84.—A QUEENSLAND DAIRY HERD.

out by operatives who have, by examination in theory and practice, proved their efficiency and hold certificates of proficiency. All dairy products are graded by qualified graders. Payments for cream are made on a commercial butter basis, and for milk on a butter-fat basis. In the interests of suppliers, a continuous audit is made of each company's books and accounts.

**Where the cow is kept and cared for the country advances, lands grow richer, homes become better, and general comfort increases.**

The Department of Agriculture and Stock has given valuable assistance in the development of dairying within the State. In its initial stage the operation of a travelling dairy for instructional purposes did much to encourage the establishment of the industry. The work of Departmental officers in the interests of the industry includes the services of the Agricultural Chemist, Bacteriologist, Botanist, Veterinary Surgeons, Instructors, Grading Inspectors, Dairy Inspectors, and Herd Testers.

Pool Boards functioning under the provisions of the Primary Producers' Organisation and Marketing Act have given valuable service to the industry by their support of administrative action tending to improve the quality of dairy products, and also by their association with marketing activities.

The development of butter and cheese manufacture in Queensland has been along scientific lines.

**The cow is the Mother of Prosperity on Queensland's dairy lands.**

## STOCK FOODS.

The wealth of our State is based to a very large extent on the number of our live stock, and the welfare of the stock again depends entirely on the feeding, therefore the question **how, when, and what to feed** is of greatest importance to farmer and grazier. All our live stock can be regarded as living factories producing from the feed consumed products useful to man.

### Objects of Feeding.

The body of the young animal requires a sufficient amount of food to supply the materials necessary for its growth. But even during any part of the growing stage there is a continual breaking down and wearing out of all the tissues of the body, and this loss must be made up by the nutrients contained in the food to maintain the animal in a normal healthy condition. Additional food is required to produce the energy for the carrying out of all voluntary and involuntary functions of the body. An animal working hard is using up a large amount of fat and muscle, but even an animal at rest requires food for the production of heat and other involuntary

functions of its body. Summarised the objects of feeding are as follow:—

(1) To maintain bodily heat;
(2) To repair waste tissues;
(3) To reproduce young;
(4) To form new tissues and organs;
(5) To perform muscular labour;
(6) To secrete various products;
(7) To lay up reserve stores.

**There is a place for the cow in the agriculture of every country.**

### Composition of Foods.

In order to get a clear insight into the art of feeding and carrying out of the objects above mentioned, we must understand the composition of the tissues that require building and renewing, and the composition of the foodstuffs available.

The composition of any stock food, analysed according to present conventional methods, is expressed as follows:—

Lucerne hay (in full flower) contains:

| | |
|---|---|
| Moisture | 10·0 per cent. |
| Crude protein | 15·0 per cent. |
| Crude fat | 2·8 per cent. |
| Carbohydrates or nitrogen free extract, by difference | 33·2 per cent. |
| Crude fibre | 31·0 per cent. |
| Ash | 8·0 per cent. |
| | 100·0 per cent. |

Putting these results in another form, we find—

| | | |
|---|---|---|
| I. Moisture | | 10·0 per cent. |
| II. Dry matter | | 90·0 per cent. |
| (A.) Ash or mineral matter | | 8·0 per cent. |
| (B.) Organic matter 82·0 per cent. | Proteins | 15·0 per cent. |
| | Fats | 2·8 per cent. |
| | Carbohydrates | 33·2 per cent. |
| | Fibre | 31·0 per cent. |

**The cow produces the goods, but man must do his part in raising and maintaining standards of quality.**

## RATIONS FOR DAIRY COWS.

The Agricultural Chemist, Mr. J. C. Brünnich, has written a Bulletin entitled "Stock Foods," in which the objects of feeding, description and analyses of various stock foods, and the making up of rations are all very fully detailed, and with this information the dairy farmer can judge how to feed to the best advantage. This Bulletin is available free of charge to every dairy farmer.

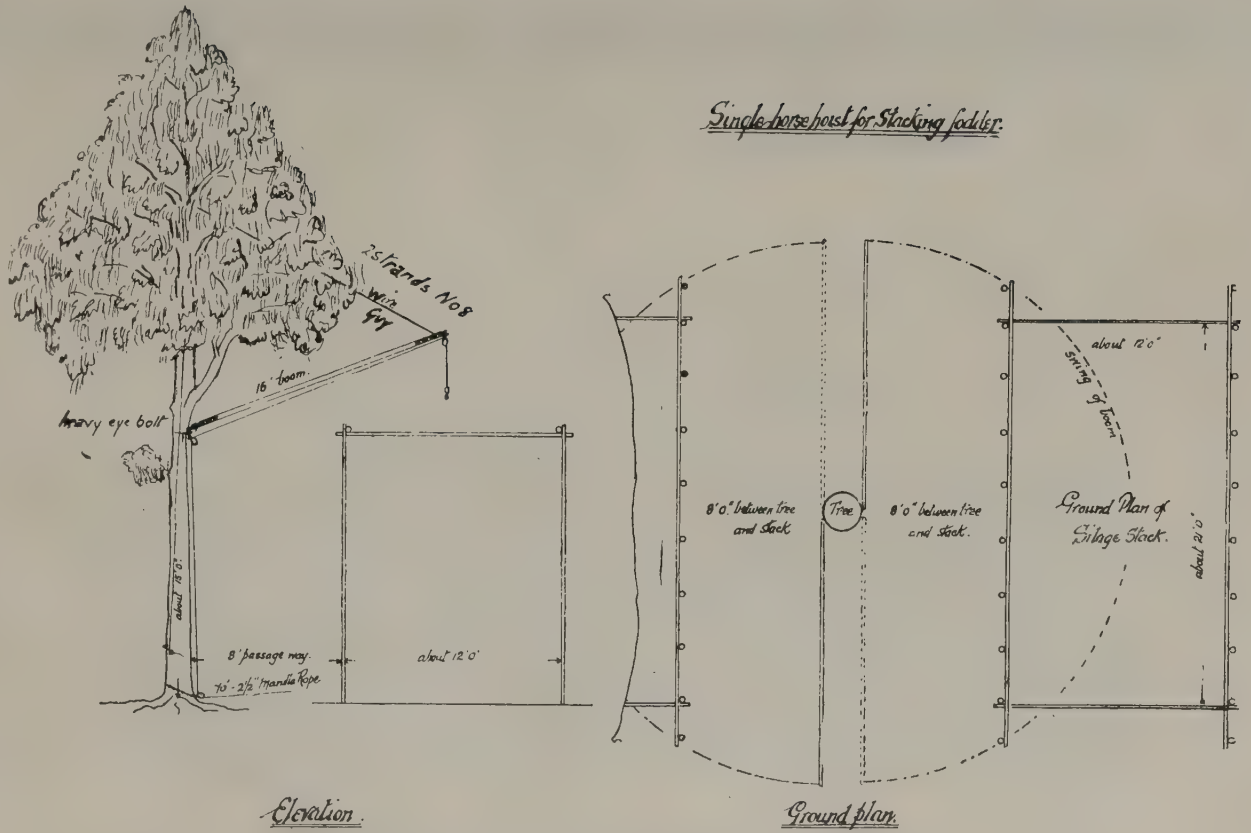


PLATE 85.—SILO STACK CONSTRUCTION AND GROUND PLAN.
Officers of the Department of Agriculture will supply full particulars as to method and material.

Ration tables are useful guides in feeding, but it must be noted that the analyses of the foodstuffs from which they are computed are averages only—that is to say, the composition of the foodstuff varies according to soil and climate wherein grown, and particularly to the age of growth when harvested.

Another consideration is the cost of a particular ration—whether it pays, when it is compared with the price obtained from the milk produced. But care should be taken that blame for unprofitable feeding is not placed upon the ration, when the fault is due to the cow. Some cows are capable of producing a large amount of milk, other cows are only capable of yielding a small amount of milk, even when supplied with ample well-balanced feed; such poor producers do not pay, and should be culled from the herd.

**The Queensland Dairying Industry is nearly a hundred per cent. co-operatively organised.**

**Ninety-eight per cent. of the butter and ninety-six per cent. of the cheese produced in Queensland are manufactured by co-operative factories under farmer control. No other country in the world, not even Denmark, can show such a great record in farmers' co-operation practically applied.**

A pamphlet entitled "Rations for Dairy Cows," written by Mr. E. H. Gurney, Senior Analyst of the Department of Agriculture and Stock, includes specimen rations which should prove of great value to dairy farmers in securing the maximum production from their individual cows consistent with economical feeding. This pamphlet is available to the dairy farmer, free of charge.

## A Healthy Cow Delivers the Goods.

The healthy milch cow, properly cared for, yields milk of first quality. Deterioration, if any, occurs after the dairy farmer takes delivery. In order to produce first quality cream, attention must be given to the production and handling of the milk, and the separation, handling, and delivery of the cream on the factory floor. The quality of the butter produced is dependent upon the quality of the cream, the care, attention, and skill of the buttermaker. The factory manager who desires to place the factory output in the highest grade must be supplied with raw products (milk or cream) of highest quality.

**The best farming methods, the most economic crops, and a steady return on investments are found on every well-managed dairy farm.**

## Grading.

Milk or cream grading is the all-important factor in determining the quality of the output. In the grading of milk or cream, or any of its products, it is essential that the grader should have his senses

PLATE 86.—A SILAGE STACK IN COURSE OF CONSTRUCTION ON A QUEENSLAND DAIRY FARM.
The small cost of the crib timbers and the method of building are obvious. Weighting material (soil) is "whipped" to the top by a single horse-power, as illustrated. This is done before topping off the stack with bush hay.

trained so as to be able to fully appreciate the natural influences of odour and flavour of a first-grade dairy product, be it milk, cream, butter, or cheese. The full natural flavour of carefully produced and well-handled milk and cream, and butter or cheese, appeals to the senses of a trained grader. The cream grader and buttermaker must keep in close touch to secure the best results of their concerted efforts. The position of grader is one of great responsibility. He must carry out his duties expeditiously and exactingly.

**Queensland needs more cows of a character that fill the bucket as well as the breeder's eye.**

### Co-operation Between Farm and Factory.

The percentage of third class cream is, happily, gradually diminishing, and we look forward to the day when only a high class cream will be supplied to butter factories. To reach that position managers must have the assistance of the dairy farmers, and they must support the farmers in turn. The farmers are not dairying for any other purpose than to make a profit. The majority are always ready to improve their methods and to take advantage of facilities offering, so as to deliver cream of an A1 quality. We must take a wide view of the varied conditions associated with the production, handling, and delivery of cream at factories.

The provisions of the Dairy Produce Act safeguard the production and handling of milk or cream, and when complied with the benefits are manifest. The delivery from farm to factory calls for attention and assistance from every one interested in the transport of milk or cream. Organisation of supplies to factories on the zone system deserves consideration by dairy factory associations. Each factory should draw its supplies from what is regarded as its own geographical area.

## MANUFACTURE OF DAIRY PRODUCTS.

All associated with the dairy industry in Queensland may be fairly commended for its progress in recent years, particularly on the manufacturing and marketing sides of the business.

Under present conditions the dairy farmers of this State, constituting with their assistants about 10 per centum of the working population, produce, not only sufficient for our entire home needs, but also contribute the equivalent of £3,000,000 a year to our export trade.

**The good breeder combines bucket capacity with show ring type.**

That the dairy products of this State have reached a high standard of quality is evident by their continued success in open competition with the production of other countries in the world's markets.

Improvement of dairy equipment has been marked within recent years, and most of our factories are of modern construction and equipment, ensuring efficiency in operation.

It has been observed that centralised factories possessing modern manufacturing machinery, and operated under efficient management, have been an important factor in increasing the quality and value of the product.

There is evidence that the establishment of a zonal system, under which central factories would receive cream supplies from the whole of a recognised tributary territory, would eliminate expensive competition and open the way for a complete organisation of cream deliveries.

More cheese is manufactured in Queensland than in any other State of the Commonwealth, and Queensland contributes over 85 per cent. of the total cheese exports from Australia.

**The most and best milk;**
**The most and best cream;**
**The most and best butter;**
**The most and best cheese;**
**The most and best profit must come from our dairy cows.**

Gradual improvement in roads and motor transport make it possible for larger centralised cheese factories to operate economically. A higher grade and a more uniform product, and consequently a better price for milk, would result from placing factories of modern design and equipment in central situations.

The attention of many Co-operative Dairy Associations interested in the manufacture of cheese is directed to these possibilities.

Few factories allow a sufficient margin in the prices paid by them for different grades of cream, with the result that the producer is not always impressed with the advantage of spending greater effort in improving the quality of his product.

As a corollary of the present system of factory payments the supplier of high-grade cream is relatively underpaid, or the supplier of inferior quality cream is overpaid. Obviously more encouragement should be given to the careful and efficient dairy farmer than the present short range of cream prices allows.

**The best is proved by test. Dairymen, test your herds!**

## Factory Buildings and Equipment.

Modern buildings and equipment are necessary for the manufacture of a high grade product and the keeping down of overhead costs.

The number of new and remodelled factories constructed in recent years is an index of the recognition by factory directors of this fact. New buildings are of brick or concrete construction.

PLATE 87.—INTERIOR OF A QUEENSLAND BUTTER FACTORY.

A factory directorate must move with the times and take advantage of every new improvement in machinery or process.

It is necessary to keep constantly in touch with modern developments in mechanism and methods of management.

### Methods of Manufacture and Factory Efficiency.

In making high-grade butter a low temperature is necessary, which means that churns have to turn longer than was formerly the practice. This also entails the provision of additional churns to minimise the hours of work in the factory. Pasteurisation and neutralisation are also claiming more attention, which entails the taking of more time in processing and the provision of extra equipment.

**Cows to cull or kill—**

**The tubercular cow.** **The irregular breeder.**
**The old cow.** **The kicker.**
**The aborting cow.** **The tough milker.**
**The poor producer.**

Manufacturing methods have improved vastly within the last ten years; and better butter has been made in Queensland factories during the past two years than ever before. There are three main reasons for this marked advance—viz., improvement in the quality of cream; stricter grading of cream; and the application of scientific methods in manufacturing processes.

Keen competition among factories tends in some instances to lower the standard of quality. When cream is classed as second the supplier sometimes resents it, and his resentment is expressed in the transfer of his dealings to another factory, which, to retain his custom, may class his product, which had fallen below the standard set by the factory to which he previously sent his cream, as first grade. This improved classification may, however, be quite justified for the dairyman, under the spur of his resentment and the realisation that greater care is necessary, may make a special effort to improve the quality of his cream. He may not, however, admit that there is an improvement in his product, or feel disposed to acknowledge that the grading at the former factory was right.

**Fodder in the tank means money in the bank.**

Queensland factory methods in general compare favourably with those of other producing States.

Too much second-grade cream is being delivered, and farmers should make a sustained effort to produce and deliver high-grade cream to the factory.

Factory efficiency is generally of a high standard, and the larger number of trained men employed in factories is also an indication of a desire to secure greater technical efficiency.

PLATE 88.—A QUEENSLAND DAIRY FARM.

## Costs of Manufacture.

Manufacturing costs are reasonable under present conditions, but they could be lessened by a more uniform supply of cream. Volume and regularity of supplies influence costs. For instance, most factories quadruple their output in the flush of the season as compared with their production in the winter months. This means that unless a factory is built and equipped for peak periods efficiency is reduced, for in the slack season more than half the plant cannot be worked to its full capacity.

**Give your cows an opportunity!**
**Feed them well.**
**Look after them well.**
**Rug them in winter.**
**Milk them clean.**

Costs could be lowered if dairymen adopted a proper system of feeding, which involves the conservation of fodder, the maintenance of a more regular cream supply, and greater uniformity in factory output throughout the year.

The amalgamation of smaller factories would be an advantage in respect to the minimising of production costs. Most of the Queensland butter-making plants are, however, so situated as to ensure a supply big enough to keep the cost of manufacture as low as practically possible.

Present costs of manufacture are reasonable, if the best quality is considered. For instance, lower churning temperatures are employed than ever before. The time of churning is therefore longer, but texture of butter is thereby greatly improved.

Short cuts in cream grading, manufacture, and other essentials can be adopted only at the expense of quality.

To sum up, costs of manufacture would be considerably reduced by creating conditions favourable to a reduction of the difference between maximum and minimum outputs of summer and winter and of dry spells. Better quality raw material would also lower costs. The cost of producing a box of second-grade butter obviously equals that of a box of higher grade.

**Test every cow and find her worth.**

**We can improve our herds if we breed from high-producing cows selected from families of high-production records.**

**Clean yards, clean cows, clean hands, clean milk, clean separators, clean cream—all mean best quality butter or cheese.**

# THE IDEAL DAIRY COW.

## Methods of Measurement.

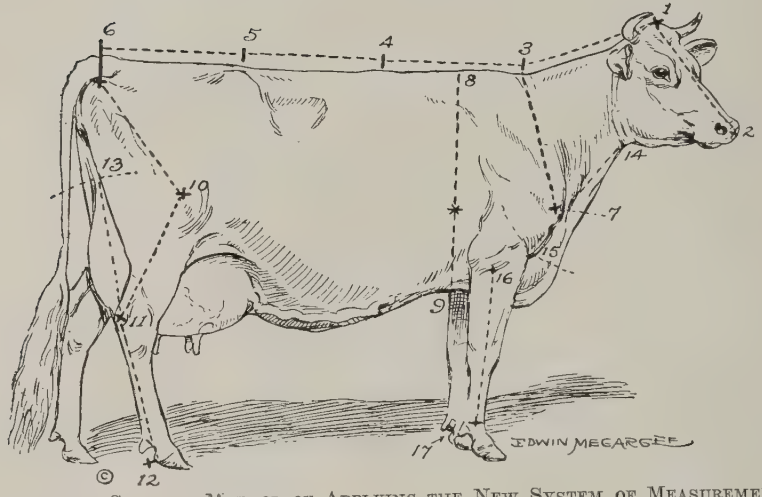


Diagram A. Showing Method of Applying the New System of Measurements.

Diagram B. Showing Measurements from Shoulder Point to Shoulder Point.

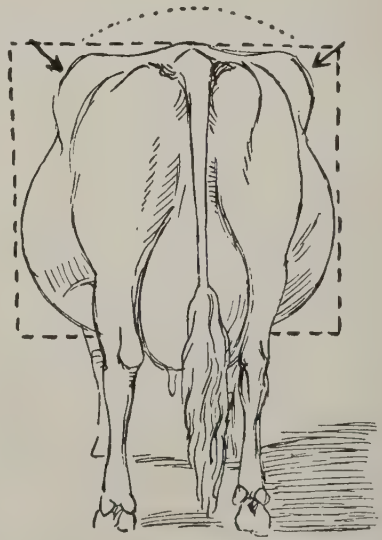

Diagram C. Showing Measurements from Hip to Hip.

Plate 89.

## MARKETING OF DAIRY PRODUCE.

The consumption per head of butter and cheese in the Commonwealth is estimated at 28 lb. of butter and 3½ lb. of cheese per annum. In comparison with these figures the United Kingdom consumption of butter is 15 lb. to 16 lb., and of cheese 7½ lb. to 10 lb. per annum. The production of butter and cheese averages 21,900 tons and 3,800 tons, respectively, per annum, the Queensland consumption being —butter, 9,860 tons; cheese, 1,280 tons per annum. In other words, Queensland produces one-fourth of the total Commonwealth production of butter and almost one-half of the Commonwealth cheese production.

**A silo well filled with suitable fodder gives that feeling of reasonable security so essential in a well-balanced industry.**

It is important to note, however, that in normal seasons Queensland exports two-thirds of its butter and cheese production. This means that the Southern States of Australia have a bigger local consumption proportionate to their production than Queensland. The Australian market is admittedly the most remunerative. The Southern States have some advantage in this regard, and, until the population and consumption of this State have materially increased, the export market will exert a very important influence on the prices secured by Queensland dairymen. While measurable control can be exercised over the local market to bring about a price that would be remunerative to the producer, and yet not unfair to the consumer, it is clear that the necessity of meeting world competition with respect to two-thirds of the butter and cheese production imposes limits upon the relief which organised marketing in Queensland can bring to the dairy farmer.

**Give the cows a chance. Conserve fodder against the dry time.**

Queensland has led all the other States in the matter of organised marketing of dairy products. Ninety-eight per cent. of the butter and about 95 per cent. of the cheese produced in Queensland is manufactured co-operatively, and all manufacturers are alive to the advantages attaching to combination in marketing.

At the request of the cheese producers, compulsory marketing was provided for by State legislation under "*The Cheese Pool Act of* 1921," which came into operation on the 1st January, 1922. On the expiry of the term for which it was constituted under the Cheese Pool Act, the Cheese Pool Board was reconstituted under "*The Primary Products Pools Act of* 1922" (now "*The Primary Producers' Organisation and Marketing Act of* 1926"). Under the Act, a Board is elected comprised of representatives of the dairy farmers engaged in cheese production. The Minister for Agriculture has one representative on the Board. The Board has power to direct and to control the marketing of cheese, but has, however, from its inception, adopted the plan of utilisation of the

existing channels of distribution. The distributors are chosen by the factories, and act as their selling agents, although under license by the Board.

**The careful dairyman thoroughly washes, scalds, and sterilises his machines after every milking.**

**Cleanliness means high quality and big cream cheques.**

## Organised Marketing of Butter.

The marketing of butter is controlled under the Primary Producers' Organisation and Marketing Act by the Queensland Butter Board, operating under that statute, the Board having been constituted on the 19th February, 1925. The Board, which is elected by cream suppliers, does not itself undertake marketing, but utilises existing channels of distribution in a somewhat similar manner to that adopted by the Cheese Board, with the exception that, in the case of the Butter Board, the agents are directly appointed by the Board. In practice the Board seeks a nomination from the factories as to the agent which the respective factories desire, and under ordinary circumstances appoints such nominee as a Butter Board agent.

The Australian Butter Stabilisation Scheme came into operation on the 1st January, 1926. Under this scheme provision is made for a levy on all butter manufactured, to provide a bonus on all butter exported. The scheme operates under agreements which are entered into between the dairying interests of each of the butter-producing States.

**Better herds mean better homes, better living, better farms, and better farmers.**

## Conclusions.

Having full regard to all the circumstances, it cannot be disputed that the Queensland dairymen have benefited very largely during recent years from the controlled marketing which has been in operation. The following points should be noted:—

1. That, owing to the preponderance of the local production which requires to be exported, no matter how well organised the local market may be, the influence of the weight of the production which has to be exported (two-thirds in the case of butter and more than one-half in the case of cheese) will always depress the average pay to the cream suppliers so long as world values are below the local price.
2. The efficient dairyman is entitled to a fair margin over and above the actual cost of production, which, on the evidence, the fair-minded consumer is prepared to concede.

**A silo means money saved and money made.**

3. There are limits as to the price which organised producers can secure for their products governed by—

(*a*) The competition of butter and cheese introduced from elsewhere.

(*b*) The competition of other products—*e.g.*, jam, honey, margarine, peanut butter, &c.

(*c*) The capacity of the consumer to pay, having regard to the cost of living and the incidence of the basic wage.

It is, therefore, evident that—

(*a*) The sphere of organised selling on the local market has been well surveyed, and the producers are well catered for under the existing control system, and little further improvement in returns can reasonably be looked for by dairymen in that direction.

(*b*) World prices do not appear likely to improve to any great extent.

(*c*) The elimination of unnecessary costs in production, manufacturing, and marketing is highly desirable.

(*d*) The adoption of the most modern methods to ensure the manufacture of a uniform product of highest quality is urgently necessary.

(*e*) The raising of the standard of production per cow affords, above all other considerations, the greatest possibility of relief to the individual dairyman.

(*f*) Improvement in quality of milk and cream leading to the elimination of all grades of raw dairy products that cannot be manufactured into butter or cheese of "Kangaroo" standard.

**A good farm with a good dairy herd, a good farmer and a good family on it, is one of the best things on earth.**

PLATE 90.

Diagram D. THIS AYRSHIRE COW, A QUEENSLAND CHAMPION, IS ALMOST IDEALLY PROPORTIONED.

Diagrams A, B, C (p. 358), and D should be applied to diagram in Bulletin No. 2 D. showing the points of a dairy cow.

## SCHEDULE 1.

### LIST OF BUTTER FACTORIES OPERATING IN QUEENSLAND.

The Atherton Tableland Co-operative Butter and Bacon Company, Limited, Atherton and Malanda.
Atherton Tableland Dairy Products, Limited, Malanda.
Bundaberg Co-operative Dairy Company, Limited, Bundaberg.
The Bushy Creek Co-operative Butter Company, Limited, Julatten, *viâ* Molloy.
Caboolture Co-operative Company, Limited—Factories at Caboolture, Pomona, and Eumundi.
The Chinchilla Co-operative Dairy Company, Limited, Chinchilla.
Conaghan Brothers, Limited, Rockhampton.
Daintree River Development Company, Daintree River, *viâ* Port Douglas.
Dawson Valley Co-operative Company, Limited, Wowan.
Dayboro' Co-operative Association, Limited, Dayboro'.
The Downs Co-operative Dairy Company, Limited—Factories at Clifton, Dalby, Miles, Toowoomba, Crow's Nest, and Goombungee.
The Esk Co-operative Dairy Company, Limited, Esk.
Gayndah Co-operative Dairy Company, Limited, Gayndah.
The Killarney Dairy Company, Limited, Killarney.
Kin Kin Co-operative Dairy Company, Limited, Cooran.
The Logan and Albert Co-operative Dairy Company, Limited, Beaudesert.
The Maleny Co-operative Dairy Company, Limited, Maleny.
The Maryborough Co-operative Dairy Company, Limited—Factories at Biggenden, Kingaroy, Maryborough, and Mundubbera.
Nanango Co-operative Dairy Company, Limited, Nanango.
The Oakey District Co-operative Butter Company, Limited, Oakey.
Pioneer Butter Factory (A. M. Linton), North Ipswich.
Pommer Brothers, Ipswich.
The Port Curtis Co-operative Butter Company, Limited, Gladstone.
Queensland Agricultural High School and College, Gatton.
Queensland Farmers' Co-operative Company, Limited—Factories at Booval, Boonah, Grantham, and Laidley.
The Rockhampton District Dairy Company, Limited, Rockhampton.
Roma Co-operative Dairy Company, Limited, Roma.
The South Burnett Co-operative Dairy Company, Limited, Murgon.
The Southern Queensland Dairy Company, Limited, Kingston.
The Stanley River Co-operative Company, Limited, Woodford.
Warwick Butter and Dairying Company, Limited—Factories at Allora, Goondiwindi, Mill Hill, Warwick, and Texas.
Wide Bay Co-operative Dairy Company, Limited—Factories at Cooroy and Gympie.
The Evelyn Tableland Dairy Association, Limited, Ravenshoe.

### CONDENSED MILK FACTORIES.

Nestle's, Toogoolawah.

## SCHEDULE 2.

### LIST OF CHEESE FACTORIES IN QUEENSLAND.

Aubigny Co-operative Dairy Company, Limited, Aubigny, *viâ* Oakey.
Austral Dairy Company, Mount Sibley road, *viâ* Greenmount.
Biddeston Co-operative Dairy Company, Limited, Biddeston, *viâ* Oakey.
Captains Mountain Co-operative Dairy Company, Limited, Milmerran.
Coalstoun Lakes Cheese Factory, *viâ* Biggenden.
Cooranga North Co-operative Cheese Association, Limited, *viâ* Bell.
The Downs Co-operative Dairy Company, Limited—Factories at Hodgson Vale, Lily vale, Gowrie Junction, Koondaii, *viâ* Bell, Westbrook, Jondaryan, Boodua.
Dundarrah Co-operative Cheese Company, Limited, *viâ* Biggenden.
Felton Co-operative Dairy Company, Limited, *viâ* Cambooya.
Greenmount Dairy Company, Limited, Greenmount.
Hitchcock, C. M., Kedron Park road, Wooloowin—Factories at Cooby, Meringandan, and Gomoran.
Irongate Co-operative Dairy Company, Limited, *viâ* Pittsworth.
I.X.L. Cheese Factory, Greenmount East.
Kooroongarra Co-operative Dairy Company, Limited, Kooroongarra.
Kumbia Cheese Factory, Emu Creek, *viâ* Crow's Nest.
Leyburn Dairy Company, Limited, Leyburn.

Lowood Cheese Factory, Lowood.
Malling Co-operative Cheese Society, Limited, *viâ* Maclagan.
The Maryborough Co-operative Dairy Company, Limited—Factories at Branch Creek, *viâ* Gayndah, and Brooklands, *viâ* Kingaroy.
Maclagan Valley Co-operative Dairy Company, Limited, Maclagan—Factories at Maclagan, Maclagan North, Rangemore, and Kulpi.
Merrimac Cheese Factory, *viâ* Worongary.
Moola Co-operative Dairy Association, Limited, *viâ* Kaimkillenbun.
The Mount Sibley Co-operative Dairy Company, Limited, Ascot, *via* Greenmount.
Mount Tyson Farmers' Co-operative Dairy Company, Limited, Mount Tyson, *viâ* Oakey.
Oakey District Co-operative Butter Company, Limited, Oakey—Factories at Kelvinhaugh, *viâ* Oakey, and Crosshill, *viâ* Oakey.
The Pittsworth Dairy Company, Limited, Pittsworth—Factories at Brookstead Linthorpe, Yarranlea, Springside, Scrubby Mountain, and Pittsworth.
Queensland Agricultural High School and College, Gatton.
Queensland Farmers' Co-operative Company, Limited, Rosevale, *viâ* Rosewood.
The Ramsay Dairy Company, Limited, Ramsay, *viâ* Cambooya.
Rocky Creek Co-operative Dairy Company, Limited, Rocky Creek, *viâ* Milmerran.
Rockview Dairy Association, Limited, Southbrook.
Rosalie Cheese Factory—Branches at Jondaryan and Kingsthorpe.
Rosemount Cheese Factory, Brymaroo.
W. Smith, Yangan Cheese Factory, Yangan.
Southbrook Co-operative Dairy Company, Limited, Southbrook.
G. V. Soutter, Silvermist Cheese Factory, Glenallyn, Malanda.
Standard Dairy Company, Limited, Wellcamp.
G. W. Stanley, Rodger's Creek, *viâ* Warwick.
The Sugarloaf Dairy Company, Limited, Sugarloaf, *viâ* Cambooya.
Sunnyvale Co-operative Cheese Company, Limited, Sunnyvale, *viâ* Bell.
Wallace, N. J., Peeramon, North Queensland.
The Warwick Butter and Dairying Company, Limited—Factories at Elbow Valley, Talgai, Bony Mountain, Victoria Hill, Pratten, Lord John Swamp, Greymare, all *viâ* Warwick.
Watt's Dairy Company, Watt's Siding.
Waverley Cheese Factory, Irvingdale, *viâ* Bowenville (McLennan Brothers).
Downs Co-operative Dairy Company, Wyreema.
Woodleigh Cheese Factory (Thomas Dare), Narko, Cooyar Line.
Quinalow Dairy Association, Limited, *viâ* Jondaryan.
Yargullen Co-operative Dairy Company, Limited, Yargullen, *viâ* Oakey.

*Photo.: Miss J. Easton.*]

PLATE 91.—THE OPEN ROAD THROUGH LUCERNE FIELDS ON COOCHIN COOCHIN, SOUTHERN QUEENSLAND.

## SUNLIGHT PIGGERY.

In reply to a request, plans of a piggery, previously given in "The Australasian," are reproduced. This "sunlight piggery" is a low, roomy structure, with its walls, floors, and partition posts built of hollow brick and concrete, while its upper framing and roof are of glass and of wood covered with asbestos roofing. The inside partitions are usually of wood, although they have been made of steel. These partitions are removable, being slipped into grooves in the sides of the concrete partition posts. All the doors are framed with reinforced concrete. The floor plan is quite convertible to suit the local requirements, having been built with a narrow feed alley, with a driveway with pens on each side, or with three rows of pens and two narrow feed alleys. However, the one feature of the house that makes it different from others is the fact that it stands with its ridge-pole running north and south, and that on each side of the ridge-pole there is a wide area covered with skylight sashes. Every part of the house is sterilised by Nature's method once every sunshiny day.

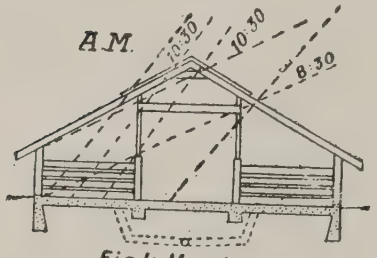


Fig 1. Morning

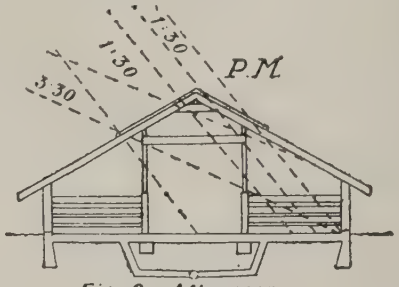


Fig 2. Afternoon

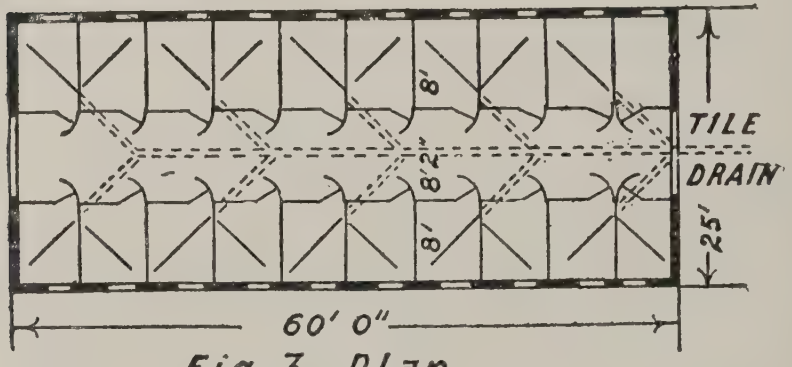


Fig. 3. Plan

In the early morning the sunlight comes through the sash windows on the east side of the roof, strikes the west wall, and, as the sun slowly rises, creeps down to and across the bedding and feed trough, until at noon the sun shines into both rows of the sash. In the afternoon the operation is reversed, and the east half of the house is sterilised. The south pen, which does not get full benefit of the roof windows, is provided for by windows in the end wall. For ventilation, these roof sashes are hinged, so that they may be raised and fastened up. The low, overhanging eaves furnish outside protection for the swine when the weather is bad, and the brick and concrete construction, along with the low roof, keep the building warm in winter. Adequate provision for drainage of the concrete floor makes it impossible for the building to become wet or sloppy inside. From a sanitary standpoint, this hoghouse approaches perfection. It is warm, dry, light, easily ventilated, conveniently arranged, and permanent. Yet the cost is not excessive. The house shown is 25 feet by 60 feet in size, and cost when complete just £160. This arrangement does away with the necessity for sun-shutters. In summer time the sun may pour in too strongly in the middle of the day, but spring blinds will provide sufficient protection.—"The Australasian."

# ROYAL NATIONAL EXHIBITION.

## ADDITIONAL AWARDS.

Following are details of some of the last Brisbane Show Awards, which are of especial interest to farmers :—

### BUTTER AND CHEESE CONTESTS.

The prize for fresh butter for local consumption was awarded to the Downs Co-operative Dairy Association's Clifton factory.

Under the conditions laid down for one of the salted classes, and also in one of the unsalted classes, two boxes were necessary to complete the entries, one of which was despatched to London, where it will be judged as soon as possible after arrival. The prizes in these two contests will be awarded to the factories whose aggregate of points awarded in London and at the Exhibition are the highest. Mr. H. Day, of the Downs Co-operative Dairy Association's factory at Toowoomba, secured the prize in the butter-makers' competition, donated by the Brisbane Newspaper Company, Limited.

FRESH BUTTER FOR LOCAL CONSUMPTION.

One box, containing not less than 56 lb., factory made.

| | Flavour. | Texture. | Colour. | Salting. | Packing and Finish. | Total. |
|---|---|---|---|---|---|---|
| Possible points .. .. .. | 65 | 20 | 7 | 4 | 4 | 100 |
| Downs Co-operative Dairy Association, Dalby .. .. .. .. | 61½ | 20 | 6½ | 4 | 3½ | 95½ |
| Downs Co-operative Dairy Association, Clifton .. .. .. .. .. | 61 | 20 | 6½ | 4 | 3½ | 95 |
| Wide Bay Co-operative Dairy Association, Gympie .. .. .. .. .. | 60 | 19½ | 7 | 4 | 4 | 94½ |
| Downs Co-operative Dairy Association, Toowoomba .. .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93 |
| Maleny Co-operative Dairy Association .. | 59 | 19½ | 7 | 4 | 3½ | 93 |
| Queensland Farmers' Co-operative Association, Booval .. .. .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Chinchilla Co-operative Dairy Association | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Alstonville Co-operative Dairy Association | 58 | 19½ | 6½ | 4 | 4 | 92 |
| Caboolture Co-operative Dairy Association, Caboolture .. .. .. .. | 58 | 19½ | 6½ | 4 | 4 | 92 |
| Downs Co-operative Dairy Association, Goombungee .. .. .. .. | 58 | 19½ | 7 | 4 | 3½ | 92 |
| Caboolture Co-operative Dairy Association, Eumundi .. .. .. .. | 57½ | 19½ | 7 | 4 | 3½ | 91½ |
| Maryborough Co-operative Dairy Association, Kingaroy .. .. .. | 57 | 20 | 7 | 4 | 3½ | 91½ |
| Muswellbrook Co-operative Dairy Association .. .. .. .. .. | 57 | 19½ | 7 | 4 | 4 | 91½ |
| Oakey District Co-operative Butter Association .. .. .. .. .. | 57½ | 19½ | 7 | 4 | 3½ | 91½ |
| Queensland Farmers' Co-operative Association, Boonah .. .. .. .. | 56½ | 20 | 7 | 4 | 4 | 91½ |
| Queensland Farmers' Co-operative Association, Grantham .. .. .. | 57½ | 19½ | 6½ | 4 | 4 | 91½ |
| Queensland Farmers' Co-operative Association, Laidley .. .. .. .. | 57½ | 19½ | 6½ | 4 | 4 | 91½ |
| Singleton Central Co-operative Dairy Association .. .. .. .. .. | 57 | 19½ | 7 | 4 | 4 | 91½ |
| Warwick Co-operative Dairy Association, Allora .. .. .. .. | 57½ | 19½ | 6½ | 4 | 4 | 91½ |
| Downs Co-operative Dairy Association, Miles | 57½ | 19½ | 6½ | 4 | 3½ | 91 |
| Esk Co-operative Dairy Association .. | 57 | 20 | 6 | 4 | 4 | 91 |
| Warwick Co-operative Dairy Association, Mill Hill .. .. .. .. | 57 | 19½ | 7 | 4 | 3½ | 91 |
| Downs Co-operative Dairy Association, Crow's Nest .. .. .. .. | 57 | 19½ | 6½ | 4 | 3½ | 90½ |

Plate 92.—Northern Tablelands of New South Wales District Exhibit—First Prize "A" Grade, District Exhibit Competition, Royal National Association Show, 1928.

Plate 93.—Wide Bay and Burnett District Exhibit—Second Prize in "A" Grade, District Exhibit Competition, Royal National Association Show, 1928.

BUTTER AND CHEESE CONTESTS—*continued.*

FRESH BUTTER FOR LOCAL CONSUMPTION—*continued.*

| | Flavour. | Texture. | Colour. | Salting. | Packing and Finish. | Total. |
|---|---|---|---|---|---|---|
| Possible points .. .. .. | 65 | 20 | 7 | 4 | 4 | 100 |
| Maryborough Co-operative Dairy Association, Biggenden .. .. .. | 57 | 19½ | 6½ | 4 | 3½ | 90½ |
| Maryborough Co-operative Dairy Association, Maryborough .. .. .. | 57½ | 19 | 6½ | 4 | 3½ | 90½ |
| Nanango Co-operative Dairy Association .. | 57 | 19½ | 6½ | 4 | 3½ | 90½ |
| Kin Kin Co-operative Dairy Associatino | 56½ | 19½ | 6½ | 4 | 4 | 90½ |
| Caboolture Co-operative Dairy Association, Pomona .. .. .. .. | 56½ | 19 | 6½ | 4 | 4 | 90 |
| Logan and Albert Co-operative Dairy Assotion .. .. .. .. | 56½ | 19 | 6½ | 4 | 4 | 90 |
| Maryborough Co-operative Dairy Association, Mundubbera .. .. .. | 56½ | 19½ | 6½ | 4 | 3½ | 90 |
| Gayndah Co-operative Dairy Association | 56 | 19 | 6½ | 4 | 3½ | 89 |
| Daintree River Dairy Association.. .. | 54½ | 19 | 6½ | 4 | 3½ | 87½ |

BUTTER-MAKERS' COMPETITION.

One box, not less than 56 lb.; no preservative other than salt permitted.

| | | | | | | |
|---|---|---|---|---|---|---|
| H. Day, Toowoomba .. .. .. | 61½ | 20 | 6½ | 4 | 3½ | 95½ |
| J. C. Dare, Goombungee .. .. .. | 60½ | 20 | 7 | 4 | 3½ | 95 |
| N. Singleton, Woodford .. .. .. | 60 | 19½ | 7 | 4 | 4 | 94½ |
| N. Smythe, Eumundi .. .. .. | 58 | 19½ | 7 | 4 | 3½ | 93 |
| J. C. Irwin, Clifton .. .. .. | 58 | 20 | 6½ | 4 | 3½ | 93 |
| K. Spoor, Mundubbera .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93 |
| W. J. Heiner, Kingaroy .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92½ |
| H. L. Pretty, Singleton .. .. .. | 58 | 19½ | 7 | 4 | 4 | 92½ |
| W. Stone, Dalby .. .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Esk Co-operative Dairy Association, nominee .. .. .. .. | 57 | 20 | 7 | 4 | 4 | 92 |
| A. W. Cork, Casino .. .. .. | 57½ | 20 | 6½ | 4 | 3½ | 91½ |
| R. Ferguson, Grantham .. .. .. | 57 | 20 | 6½ | 4 | 4 | 91½ |
| R. E. Rose, Booval .. .. .. | 57 | 19½ | 7 | 4 | 4 | 91½ |
| G. Tomlinson, Boonah .. .. .. | 56½ | 20 | 7 | 4 | 4 | 91½ |
| J. G. White, Gympie .. .. .. | 57 | 19½ | 7 | 4 | 4 | 91½ |
| W. Byrne, Miles .. .. .. .. | 57½ | 19½ | 6½ | 4 | 3½ | 91 |
| H. Cherry, Oakey .. .. .. | 57½ | 19½ | 6½ | 4 | 4 | 91 |
| Nowra Dairy Co., nominee .. .. | 57 | 19½ | 6½ | 4 | 4 | 91 |
| M. J. Flynn, Gayndah .. .. .. | 56½ | 19½ | 6½ | 4 | 3½ | 90 |
| H. J. Neill, Maleny .. .. .. | 56½ | 19½ | 6½ | 4 | 3½ | 90 |
| G. Pitt, Laidley .. .. .. .. | 56 | 19½ | 7 | 4 | 3½ | 90 |
| R. Saunders, Caboolture .. .. .. | 56 | 19½ | 6½ | 4 | 4 | 90 |
| Chinchilla Co-operative Dairy Association, nominee .. .. .. .. | 56½ | 19½ | 6½ | 4 | 3½ | 90 |
| J. H. Bretz, Crow's Nest .. .. | 56½ | 19 | 6½ | 4 | 3½ | 89½ |
| R. C. Eggins, Casino .. .. .. | 56½ | 19½ | 6½ | 4 | 4 | 89½ |
| T. Spence, Beaudesert .. .. .. | 56½ | 19 | 6 | 4 | 4 | 89½ |
| G. Bubke, Biggenden .. .. .. | 56½ | 19 | 6 | 4 | 3½ | 89 |
| D. J. Forrest, Muswellbrook .. .. | 55½ | 19 | 6½ | 4 | 4 | 89 |
| A. Veiritz, Pomona .. .. .. | 56 | 19 | 6 | 4 | 4 | 89 |
| C. T. Warner, Maryborough .. .. | 55½ | 19½ | 6½ | 4 | 3½ | 89 |
| K. Hargreaves, Daintree .. .. .. | 55 | 19 | 6 | 4 | 3½ | 87½ |

## EVEN QUALITY.

JUDGE'S COMMENTS.

"The outstanding feature in the butter classes judged at this show is the evenness of quality throughout, but compared with the exhibits last year it is hardly up to that high standard, although the prize awards, I think, stand out in point of excellence, despite a slight lack of rich character flavour," said Mr. G. S. Stening (judge of butter) in the course of an interview.

Possibly, he added, the prolific season experienced in Queensland had been a contributing factor, but exhibitors were to be congratulated on improvement very noticeable in manufacture. Processing and pasteurisation of cream were details that had received very strict attention, and in the majority of exhibits had been carried out efficiently, but there was one detail in manufacture that he would again draw attention to. That was lower churning temperature and longer working time. That would produce that tough, waxy texture so desirable, especially in export butter, for when it was considered that texture played such an important part in the keeping quality of butter it was essential that this detail should be given more attention.

Mr. Stening observed that so far the results of the Orient Jubilee Competition were not available, and hence the prizes for aggregate could not be awarded, as it provided for the aggregate of points in all classes, but it was hoped that the result, which was dependent upon the judge of butter in London, would not be long delayed.

In class 1382, continued the judge, the Queensland Farmers' Co-operative Association, Grantham, had been placed first with a very fine sample, being excellently made, and of delicate flavour. The Downs Co-operative Dairy Association, Toowoomba, and the Downs Co-operative Association, Goombungee, were second and third not very far behind the first prize-winner, and in those two it would be noticed when the points cards were studied that half a point in each had been deducted for finish, due solely to the want of an edging around the honey-combed surface which imparted a more attractive and finished appearance to the butter. In class 1379 the Downs Co-operative, Toowoomba, had been placed first, with Nowra Dairy Company, New South Wales, second, and Downs Co-operative Association, Clifton, third. These three were very fine exhibits, and would be place-getters at any show.

In the fresh classes of butter for local consumption the Downs Co-operative, Dalby, had been placed first, Clifton second, and Wide Bay third. In the butter-makers' class H. Day had won, C. Dair had been second, and Norman Singleton third. All these were fine exhibits, but remarks about manufacture applied very forcibly in these fresh classes. Knowing as he did the difficulties encountered with winter manufacture because of lower acid content of the cream, managers would be well advised to study closely the factors of churning temperature and working, for many of the butters exhibited in these two classes were inclined to be greasy and open in texture, and had lost points accordingly.

## EXPORT BUTTER.

Honours in the export butter classes were this year divided between the Downs Co-operative Dairy Association, Limited, and the Queensland Farmers' Co-operative Association, Limited. Competition was keen, only half-points separating the place-getters in each of the two classes judged. Details:—

### Butter for Export.

Six weeks' storage, salted, one box of not less than 56 lb.; manufactured in Queensland from pasteurised cream, suitable for table use in Britain.

| | Flavour | Texture. | Colour. | Salting. | Packing and Finish. | Total. |
|---|---|---|---|---|---|---|
| Possible points .. .. .. | 65 | 20 | 7 | 4 | 4 | 100 |
| Queensland Farmers' Co-operative Association, Grantham .. .. .. | 60 | 20 | 7 | 4 | 4 | 95 |
| Downs Co-operative Dairy Association, Toowoomba .. .. .. .. | 60 | 20 | 7 | 4 | 3½ | 94½ |
| Downs Co-operative Dairy Association, Goombungee .. .. .. .. | 59½ | 20 | 7 | 4 | 3½ | 94 |
| Logan and Albert Co-operative Dairy Association .. .. .. .. | 58½ | 20 | 7 | 4 | 4 | 93½ |
| Queensland Farmers' Co-operative Association, Laidley .. .. .. .. | 58½ | 20 | 7 | 4 | 4 | 93½ |

BUTTER FOR EXPORT—*continued.*

Six weeks' storage, salted, one box of not less than 56 lb.; manufactured in Queensland from pasteurised cream, suitable for table use in Britain—*continued.*

| | Flavour. | Texture. | Colour. | Salting. | Packing and Finish. | Total. |
|---|---|---|---|---|---|---|
| Possible points .. .. .. | 65 | 20 | 7 | 4 | 4 | 100 |
| Stanley River Co-operative Association .. | 58½ | 20 | 7 | 4 | 4 | 93½ |
| Warwick Co-operative Dairy Association, Mill Hill .. .. .. .. | 58½ | 20 | 7 | 4 | 4 | 93½ |
| Caboolture Co-operative Association, Eumundi .. .. .. .. .. | 59 | 19½ | 7 | 4 | 3½ | 93 |
| Downs Co-operative Dairy Association, Clifton .. .. .. .. .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Downs Co-operative Dairy Association, Dalby .. .. .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93 |
| Esk Co-operative Dairy Association .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Wide Bay Co-operative Dairy Association, Gympie .. .. .. .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Downs Co-operative Dairy Association, Miles .. .. .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93½ |
| Dayboro' Co-operative Dairy Association | 58 | 20 | 7 | 3½ | 4 | 92½ |
| Downs Co-operative Dairy Association, Crow's Nest .. .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Maryborough Co-operative Dairy Association, Kingaroy .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92 |
| Oakey District Co-operative Butter Association .. .. .. .. .. | 58½ | 20 | 6½ | 4 | 3½ | 92 |
| Queensland Farmers' Co-operative Association, Booval .. .. .. | 58 | 20 | 7 | 3½ | 4 | 92½ |
| Maleny Co-operative Dairy Association .. | 58 | 19½ | 6½ | 4 | 3½ | 91 |
| Caboolture Co-operative Association, Pomona .. .. .. .. .. | 57 | 19½ | 6½ | 4 | 4 | 91 |
| Gayndah Co-operative Dairy Association | 57½ | 19½ | 7 | 4 | 3 | 91 |
| Nanango Co-operative Dairy Association | 58 | 19 | 6½ | 4 | 3½ | 91 |
| Maryborough Co-operative Dairy Association, Biggenden .. .. .. | 57½ | 19 | 6 | 4 | 4 | 90½ |
| Maryborough Co-operative Dairy Association, Mundubbera .. .. .. | 57½ | 19½ | 6¾ | 4 | 3½ | 90½ |
| Warwick Co-operative Dairy Association, Allora .. .. .. .. .. | 57 | 19 | 6½ | 4 | 4 | 90 |
| Caboolture Co-operative Association, Caboolture .. .. .. .. | 58 | 19 | 6 | 3½ | 3½ | 90 |
| Maryborough Co-operative Dairy Association, Maryborough .. .. .. | 56 | 19½ | 7 | 4 | 3½ | 90 |
| Queensland Farmers' Co-operative Association, Boonah .. .. .. .. | 57 | 19½ | 6½ | 3 | 3½ | 89½ |

Thirty days' storage, one box of not less than 56 lb.

| | | | | | | |
|---|---|---|---|---|---|---|
| Downs Co-operative Dairy Association, Toowoomba .. .. .. .. | 60½ | 20 | 7 | 4 | 3½ | 95 |
| Nowra Dairy Co. .. .. .. .. | 59½ | 20 | 7 | 4 | 4 | 94½ |
| Downs Co-operative Dairy Association, Clifton .. .. .. .. .. | 59 | 20 | 7 | 4 | 4 | 94 |
| Singleton Central Co-operative Dairy Association .. .. .. .. .. | 58½ | 20 | 7 | 4 | 4 | 90½ |
| Queensland Farmers' Co-operative Association, Grantham .. .. .. | 58½ | 20 | 7 | 4 | 4 | 93½ |
| Muswellbrook Dairy Co. .. .. .. | 57½ | 20 | 7 | 4 | 3½ | 93 |
| Downs Co-operative Dairy Association, Dalby .. .. .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93 |

BUTTER FOR EXPORT—*continued.*

Thirty days' storage, one box of not less than 56 lb.—*continued.*

| — | Flavour. | Texture. | Colour. | Salting. | Packing and Finish. | Total. |
|---|---|---|---|---|---|---|
| Possible points .. .. .. | 65 | 20 | 7 | 4 | 4 | 100 |
| Maryborough Co-operative Dairy Association, Kingaroy .. .. .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Maryborough Co-operative Dairy Association, Mundubbera .. .. .. | 57½ | 20 | 7 | 4 | 3½ | 93 |
| Oakey District Co-operative Butter Association .. .. .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93 |
| Queensland Farmers' Co-operative Association, Laidley .. .. .. .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Warwick Co-operative Dairy Association, Mill Hill .. .. .. .. | 58½ | 20 | 7 | 4 | 3½ | 93 |
| Wide Bay Co-operative Dairy Association, Gympie .. .. .. .. .. | 58 | 20 | 7 | 4 | 4 | 93 |
| Downs Co-operative Dairy Association, Goombungee .. .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Dayboro' Co-operative Dairy Association | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Downs Co-operative Dairy Association, Crow's Nest .. .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Downs Co-operative Dairy Association, Miles .. .. .. .. .. | 58 | 20 | 7 | 4 | 3½ | 92½ |
| Queensland Farmers' Co-operative Association, Booval .. .. .. .. | 57½ | 20 | 7 | 4 | 4 | 92½ |
| Alstonville Co-operative Dairy Association | 57½ | 19½ | 6½ | 4 | 4 | 91½ |
| Queensland Farmers' Co-operative Association, Boonah .. .. .. .. | 57½ | 19½ | 7 | 4 | 3½ | 91½ |
| Caboolture Co-operative Association, Eumundi .. .. .. .. | 57 | 19½ | 7 | 4 | 3½ | 91 |
| Casino Co-operative Dairy Society .. | 57½ | 19½ | 6½ | 4 | 3½ | 91 |
| Downs Co-operative Dairy Association, Miles .. .. .. .. .. | 57 | 19½ | 7 | 4 | 3½ | 91 |
| Logan and Albert Co-operative Dairy Association .. .. .. .. .. | 57 | 19½ | 7 | 4 | 3½ | 91 |
| Maleny Co-operative Dairy Association .. | 57 | 19½ | 7 | 4 | 3½ | 91 |
| Maryborough Co-operative Dairy Association, Maryborough .. .. .. | 57 | 19½ | 6½ | 4 | 3½ | 90½ |
| Stanley River Co-operative Association .. | 56 | 19½ | 7 | 4 | 4 | 90½ |
| Gayndah Co-operative Dairy Association | 57 | 19½ | 6½ | 4 | 3½ | 90½ |
| Esk Co-operative Association .. .. | 56½ | 19½ | 6½ | 4 | 3½ | 90 |
| Maryborough Co-operative Dairy Association, Biggenden .. .. .. | 56½ | 19½ | 6½ | 4 | 3½ | 90 |
| Caboolture Co-operative Association, Caboolture .. .. .. .. | 56½ | 19 | 6 | 4 | 4 | 89½ |
| Nanango Co-operative Dairy Association | 56 | 19 | 6½ | 4 | 3½ | 89 |
| Caboolture Co-operative Association, Pomona .. .. .. .. .. | 55 | 19 | 6 | 3½ | 4 | 87½ |

Plate 94.—Brisbane Valley District Exhibit.
1st Prize "B" Grade, District Exhibit Competition, Royal National Association's Show, 1928.

Plate 95.—Northern Darling Downs District Exhibit, 2nd in "B" District Exhibit Competition, Royal National Association Show, 1928.

## CHEESE COMPETITION.

The Southbrook Co-operative Dairy Association Limited won the prizes in both the white and coloured export classes, and the Downs Co-operative Dairy Association's Westbrook factory that for the loaf cheese under six weeks old. The cheese-maker of the Biddeston Association secured the special prize awarded which follows in conjunction with that company having secured the highest aggregate in the competitions. Details:—

Export Cheese, coloured, suitable for English market, two cheeses each 70 lb. to 80 lb. (One judged on arrival and other forwarded to London, where it will be judged.)

| | Flavour. | Texture. | Colour. | Finish. | Total. |
|---|---|---|---|---|---|
| Possible points | 50 | 25 | 15 | 10 | 100 |
| Southbrook Co-operative Dairy Co., Ltd. | 44 | 25 | 15 | 10 | 94 |
| Biddeston Co-operative Dairy Association | 43½ | 25 | 15 | 10 | 93½ |
| Downs Co-operative Dairy Association, Lilyvale | 43½ | 25 | 14½ | 10 | 93 |
| Irongate Co-operative Dairy Association | 43½ | 25 | 14½ | 10 | 93 |
| Pittsworth Dairy Company "P" factory | 43½ | 24½ | 14½ | 10 | 92½ |
| Pittsworth Dairy Co., "Y" factory | 44 | 25 | 13½ | 10 | 92½ |
| Downs Co-operative Dairy Association, Westbrook | 43 | 24¾ | 14½ | 10 | 92¼ |
| Yargullen Co-operative Dairy Association | 42 | 25 | 15 | 10 | 92 |
| Downs Co-operative Dairy Association, Koondai | 42½ | 25 | 14½ | 10 | 92 |
| Oakey District Co-operative Association, Crosshill | 42½ | 24¾ | 14½ | 10 | 91¾ |
| Downs Co-operative Dairy Association, Hodgson's Vale | 42 | 25 | 14½ | 10 | 91½ |
| Downs Co-operative Dairy Association, Wyreema | 42 | 25 | 14½ | 10 | 91½ |
| Oakey District Co-operative Dairy Association, Kelvinhaugh | 42 | 24¾ | 14½ | 10 | 91¼ |
| Mount Tyson Farmers' Co-operative Dairy Association | 42 | 25 | 14 | 10 | 91 |
| Woodleigh Cheese Factory | 42 | 24½ | 14¾ | 9½ | 90¾ |
| Waverley Cheese Factory | 41 | 24¾ | 14½ | 10 | 90¼ |
| Maclagan Valley Co-operative Dairy Association | 41½ | 25 | 13½ | 10 | 90 |
| Warwick Co-operative Dairy Association, Bony Mountain | 41 | 25 | 14 | 10 | 90 |
| Downs Co-operative Dairy Association, Boodua | 41½ | 24½ | 13 | 10 | 89 |
| Warwick Co-operative Dairy Association, Greymare | 39 | 24½ | 14 | 10 | 87½ |

Export Cheese, white, suitable for English market, two cheeses, each 70 lb. to 80 lb.

| | | | | | |
|---|---|---|---|---|---|
| Southbrook Co-operative Dairy Association | 44½ | 24¾ | 14¾ | 10 | 94 |
| Irongate Co-operative Dairy Association | 44½ | 24½ | 14¾ | 9¾ | 93½ |
| Biddeston Co-operative Dairy Association | 44 | 24¾ | 14½ | 10 | 93¼ |
| Mount Tyson Farmers' Co-operative Dairy Association | 43 | 25 | 15 | 10 | 93 |
| Pittsworth Dairy Co., "P" factory | 44 | 24½ | 14½ | 10 | 93 |
| Waverleigh Cheese Factory | 43 | 25 | 15 | 10 | 93 |
| Downs Co-operative Dairy Association, Wyreema | 43 | 25 | 15 | 9¾ | 92¾ |
| Yargullen Co-operative Dairy Association | 43 | 24½ | 15 | 10 | 92½ |
| Maclagan Valley Co-operative Dairy Association | 43 | 24½ | 15 | 10 | 92½ |
| Downs Co-operative Dairy Association, Koondai | 43 | 25 | 14½ | 10 | 92½ |
| Downs Co-operative Dairy Association, Lilyvale | 43 | 24½ | 14¾ | 10 | 92¼ |
| Oakey District Co-operative Dairy Association, Kelvinhaugh | 42½ | 24¾ | 14½ | 10 | 91¾ |
| Warwick Co-operative Dairy Association, Greymare | 41½ | 25 | 15 | 10 | 91½ |
| Woodleigh Cheese Factory | 42 | 24¾ | 14¾ | 10 | 91½ |
| Downs Co-operative Dairy Association, Boodua | 42½ | 24¾ | 14¾ | 10 | 91 |
| Downs Co-operative Dairy Association, Hodgson's Vale | 41½ | 24½ | 14¾ | 10 | 90¾ |
| Oakey District Co-operative Dairy Association, Crosshill | 41½ | 24½ | 14½ | 10 | 90½ |

CHEESE COMPETITION—*continued.*

Loaf Cheese, under six weeks old; two, each not exceeding 12 lb.

| | Flavour. | Texture. | Colour. | Finish. | Total. |
|---|---|---|---|---|---|
| Possible points .. .. .. .. | 50 | 25 | 15 | 10 | 100 |
| Downs Co-operative Dairy Association, Westbrook | 44½ | 25 | 14½ | 10 | 94 |
| Biddeston Co-operative Dairy Association .. | 44 | 25 | 14¾ | 10 | 93¾ |
| Downs Co-operative Dairy Association, Koondai | 44 | 25 | 14½ | 9¾ | 93¼ |
| Downs Co-operative Dairy Association, Hodgson's Vale .. .. .. .. .. .. | 43½ | 25 | 14½ | 10 | 93 |
| Downs Co-operative Dairy Association, Lilyvale .. | 43 | 25 | 15 | 10 | 93 |
| Downs Co-operative Dairy Association, Wyreema | 43 | 24¾ | 14½ | 10 | 92¼ |
| Pittsworth Dairy Co., "P" factory .. .. | 43 | 24½ | 14½ | 10 | 92 |
| Pittsworth Dairy Co., "Y" factory .. .. | 43 | 24½ | 14½ | 10 | 92 |
| Yargullen Co-operative Dairy Association .. | 42½ | 24½ | 14¾ | 10 | 91¾ |
| Irongate Co-operative Dairy Association .. | 42½ | 25 | 14½ | 9¾ | 91¾ |
| Downs Co-operative Dairy Association, Boodua .. | 42½ | 24½ | 14½ | 10 | 91½ |
| Oakey Co-operative Dairy Association, Kelvinhaugh .. .. .. .. .. .. | 42 | 25 | 14½ | 10 | 91½ |
| Woodleigh Cheese Factory .. .. .. | 42½ | 24½ | 14¾ | 9½ | 91¼ |
| Maclagan Valley Co-operative Dairy Association | 42 | 24½ | 14½ | 10 | 91 |
| Southbrook Co-operative Dairy Association .. | 41 | 25 | 15 | 10 | 91 |
| Waverleigh Cheese Factory .. .. .. | 41½ | 25 | 14½ | 9¼ | 90¼ |
| Warwick Co-operative Dairy Association, Bony Mountain .. .. .. .. .. .. | 41 | 25 | 14 | 10 | 90 |
| Warwick Co-operative Dairy Association, Greymare .. .. .. .. .. .. | 39 | 25 | 14 | 9 | 87 |

Medium Cheese, over two months old; two, each not exceeding 40 lb.

| | | | | | |
|---|---|---|---|---|---|
| Southbrook Co-operative Dairy Association .. | 45½ | 25 | 15 | 9½ | 95 |
| Downs Co-operative Dairy Association, Lilyvale .. | 44½ | 25 | 15 | 10 | 94½ |
| Downs Co-operative Dairy Association, Boodua .. | 44 | 25 | 15 | 10 | 94 |
| Biddeston Co-operative Dairy Association .. | 44 | 24½ | 14 | 10 | 93 |
| Oakey District Co-operative Dairy Association, Crosshill .. .. .. .. .. .. | 43 | 25 | 14½ | 10 | 92½ |
| Downs Co-operative Dairy Association, Westbrook | 43 | 25 | 15 | 9½ | 92½ |
| Woodleigh Cheese Factory .. .. .. | 42 | 25 | 15 | 9½ | 91½ |
| Pittsworth Dairy Co., "P" factory .. .. | 42½ | 24½ | 14½ | 10 | 91½ |
| Downs Co-operative Dairy Association, Koondai | 41½ | 25 | 15 | 9½ | 91 |
| Sunnyvale Co-operative Cheese Association .. | 42 | 25 | 14½ | 9½ | 91 |
| Yargullen Co-operative Dairy Association .. | 42½ | 24½ | 14½ | 9½ | 91 |
| Downs Co-operative Dairy Association, Hodgson's Vale .. .. .. .. .. .. | 42 | 25 | 14½ | 9 | 90½ |
| Maclagan Valley Co-operative Dairy Association | 41½ | 25 | 14½ | 9½ | 90½ |
| Oakey District Co-operative Dairy Association, Kelvinhaugh .. .. .. .. .. | 41 | 25 | 14½ | 9½ | 90 |
| Downs Co-operative Dairy Association, Wyreema | 41 | 24½ | 14½ | 9½ | 89½ |
| Warwick Co-operative Dairy Association, Greymare .. .. .. .. .. .. | 39 | 25 | 14½ | 9½ | 88 |

Medium Cheese, under six weeks old; two, each not exceeding 40 lb.

| | | | | | |
|---|---|---|---|---|---|
| Biddeston Co-operative Dairy Association .. | 44½ | 25 | 15 | 10 | 94½ |
| Downs Co-operative Dairy Association, Westbrook | 44 | 25 | 14½ | 10 | 93½ |
| Pittsworth Dairy Co., "Y" factory .. .. | 43½ | 25 | 15 | 9¾ | 93¼ |
| Downs Co-operative Dairy Association, Koondai | 43 | 25 | 15 | 10 | 93 |
| Pittsworth Dairy Co., "P" factory .. .. | 44½ | 24½ | 14½ | 9½ | 93 |
| Southbrook Co-operative Dairy Association .. | 42½ | 25 | 15 | 9¾ | 92¼ |
| Downs Co-operative Dairy Association, Wyreema | 43 | 25 | 14½ | 9½ | 92 |
| Yargullen Co-operative Dairy Association .. | 42 | 25 | 14½ | 9¾ | 91¼ |
| Downs Co-operative Dairy Association, Boodua .. | 41½ | 25 | 14½ | 10 | 91 |
| Downs Co-operative Dairy Association, Lilyvale .. | 41½ | 25 | 14½ | 10 | 91 |
| Irongate Co-operative Dairy Association .. | 42½ | 24½ | 14½ | 9½ | 91 |

PLATE 96.—THE REMARKABLE RANGE OF SUBSIDIARY INDUSTRIES, WHICH DEPEND UPON THE PASTORAL INDUSTRY FOR RAW MATERIAL, WAS REPRESENTED MOST STRIKINGLY IN THE MEAT HALL AT THIS YEAR'S BRISBANE SHOW.

PLATE 97.—A FINE DISPLAY FROM THE STATE CANNERY.

CHEESE COMPETITION—*continued.*

Medium Cheese under six weeks old; two, each not exceeding 40 lb.—*continued.*

| | Flavour. | Texture. | Colour. | Finish. | Total. |
|---|---|---|---|---|---|
| Possible points | 50 | 25 | 15 | 10 | 100 |
| Oakey District Co-operative Dairy Association, Kelvinhaugh | 42½ | 24½ | 14½ | 9½ | 91 |
| Waverley Cheese Factory | 41½ | 25 | 15 | 9½ | 91 |
| Warwick Co-operative Dairy Association, Bony Mountain | 41 | 25 | 14½ | 9¾ | 90¼ |
| Maclagan Valley Co-operative Dairy Association | 41 | 25 | 14½ | 9½ | 90 |
| Woodleigh Cheese Factory | 41½ | 24½ | 14½ | 9½ | 90 |
| Downs Co-operative Dairy Association, Hodgson's Vale | 40 | 25 | 15 | 10 | 90 |
| Warwick Co-operative Dairy Association, Greymare | 40½ | 25 | 14½ | 9½ | 89½ |

Loaf Cheese, over two months old; two, each not exceeding 12 lb.

| | | | | | |
|---|---|---|---|---|---|
| Downs Co-operative Dairy Association, Westbrook | 44 | 25 | 14½ | 10 | 93½ |
| Biddeston Co-operative Dairy Association | 43 | 25 | 15 | 10 | 93 |
| Downs Co-operative Dairy Association, Boodua | 43 | 25 | 14½ | 10 | 92½ |
| Downs Co-operative Dairy Association, Lilyvale | 41½ | 25 | 14½ | 10 | 91½ |
| Maclagan Valley Co-operative Dairy Association | 41½ | 25 | 14 | 10 | 90½ |
| Yargullen Co-operative Dairy Association | 41½ | 24½ | 14½ | 9¾ | 90¼ |
| Southbrook Co-operative Dairy Association | 41 | 25 | 14½ | 9¾ | 90¼ |
| Oakey Distict Co-operative Dairy Association | 41 | 25 | 14½ | 9½ | 90 |
| Downs Co-operative Dairy Association, Wyreema | 40½ | 25 | 14½ | 10 | 90 |
| Downs Co-operative Dairy Association, Hodgson's Vale | 41 | 25 | 14½ | 9½ | 90 |
| Woodleigh Cheese Factory | 41 | 25 | 14½ | 9½ | 90 |
| Sunnyvale Co-operative Cheese Association | 41 | 24½ | 14½ | 9¾ | 89¾ |
| Pittsworth Dairy Co., "P" factory | 40 | 25 | 14½ | 9¾ | 89¼ |
| Oakey District Co-operative Dairy Association, Crosshill | 39 | 25 | 15 | 9½ | 88½ |
| Downs Co-operative Dairy Association, Koondai | 39 | 25 | 14½ | 9¾ | 88¼ |
| Warwick Co-operative Dairy Association, Greymare | 39 | 25 | 14 | 9½ | 87½ |

Special Prize for factory securing the greatest aggregate of points in all classes except trophy.

| | Total points. |
|---|---|
| Biddeston C.D.A. | 561 |
| Downs C.D.A., Westbrook | 558¾ |
| Southbrook C.D.A. | 556½ |
| Downs C.D.A., Lilyvale | 550¾ |
| Downs C.D.A., Koondai | 550 |
| Downs C.D.A., Boodua | 549 |
| Yargullen C.D.A. | 548¾ |
| Downs C.D.A., Wyreema | 548 |
| Downs C.D.A., Hodgson's Vale | 545¾ |
| Pittsworth D.C. "P" Factory | 545¾ |
| Woodleigh Cheese Factory | 545 |
| Maclagan Valley C.D.A. | 544½ |

*Trophy of Cheese.*—Downs Co-operative Dairy Association's Lilyvale Factory, 1; Pittsworth Dairy Company's "P" Factory, 2.

## JUDGE'S COMMENTS.

"Taking the cheese exhibit as a whole, the quality was somewhat disappointing. Many of the entries scarcely reached the minimum points for choice grade cheese. The principal defects were in flavour, texture, and colour."

These were the views of the judge (Mr. M. Wallace, senior grader, Commonwealth Grading Branch, Brisbane), as expressed in an interview.

"In many cheeses the flavour was faulty," said the judge, "the body inclining to be too firm and the texture rough. The most notable defect, however, was in the colour, a distinct mottle or streak being apparent in a great many of the entries in both the coloured and uncoloured classes. This was often associated with weakness in flavour and sometimes a pastiness in the body. This weakness was expected in view of the fact that at the time a large proportion of the cheese was manufactured, streakiness or mottle was causing cheese-makers a considerable amount of trouble. The points awarded for even the best cheese were not so high as the judge felt inclined to award in many previous years. One feature on which the manufacturers can be congratulated is the excellence of finish in nearly all of the exhibits, a large proportion securing full points for this.

### Value of Trophies.

"There were two entries for the class for the trophies, and seldom has a better display in this respect been offered in the cheese pavilion. The arrangements in each of the trophies were entirely dissimilar, making it very difficult to assess the respective values in display and effect. The quality of the cheese in both trophies was good, the Unity cheese being only slightly better than the cheese on the Pittsworth stand. The display in both was excellent, and the effectiveness of the lighter arrangement in the winning trophies gave it an advantage over the more solid appearance of the cheese staged by the Pittsworth company. These trophies are more than spectacular. To the average person engaged in the manufacture of cheese they convey many lessons in the finish and general get-up which would be of advantage if applied to some extent at least to the ordinary output of a factory. In fact, much of the credit for the general attractive appearance of the cheese shown at the show and also that of ordinary manufacture in Queensland is due to the lessons to be learned from these trophies.

"Speaking generally, the quality of the cheese exhibits may be said to reflect the average quality produced in Queensland during autumn and early winter. The figures for the two Orient classes will not be available until the cheese to be despatched to London are judged there, when the entries securing the highest aggregate points at Brisbane and London will be declared the winners."

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## FRUIT PACKING.

John Macdonald Shield.

The fruit-packing competition for present and past pupils attending fruit-packing classes under the Department of Agriculture resulted:—

| | Points. |
|---|---|
| Palmwoods School, No 1 team | 822 |
| Mapleton School | 797 |
| Montville | 790 |
| Flaxton | 785 |
| Palmwoods, No. 2 team | 781 |
| Woombye | 771 |
| Buderim Mountain | 764½ |
| Nambour | 742 |

*Best Individual Fruit Packs.*—Miss Alice Hall (Palmwoods), Master Tom Briggs (Palmwoods), and Miss Freda Pack (Mapleton), equal, 84 points, 1; Miss Verle Hobson (Palmwoods), and Miss Isobel Murray (Palmwoods), equal, 83½ points, 2.

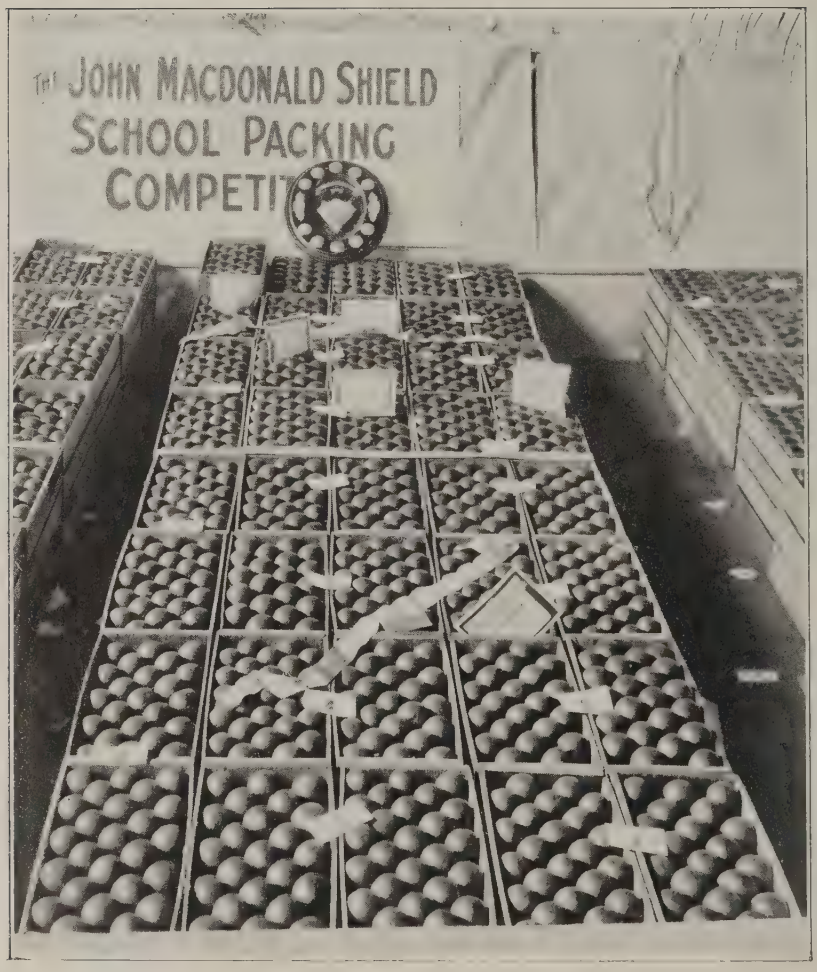


Plate 98.—A Winning Exhibit in Fruit Packing from Palmwoods' School No. 1 Team.

The John Macdonald Shield Competition in Fruit Packing is a popular Annual Contest. The competitors are present and past pupils of State Schools attending fruit packing classes under the Department of Agriculture.

Plate 99.—Another close-up of the Central Trophy in the Court of the Department of Agriculture and Stock.
Illustrating the practical work done by Departmental Specialists in Crop Improvement.

Plate 100.

This Display by the Queensland Agricultural High School and College illustrated the advance made in this State in rural education ; and also the work and efficient training of student farmers.

## ONE-FARM COMPETITION.

Winners of the 1927 one-farm competition, Messrs. Franke and Sons, repeated their success at this year's Exhibition. Mr. J. Beck, who travelled 400 miles from his farm at Stanwell to compete, filled second place. This class attracted entries from Messrs. W. D. Ponton (Tuggerah, N.S.W.), E. J. Rossow (Nanango), J. Beck (Stanwell), H. Franke and Sons (Cawdor), and J. T. Whiteway (Buderim). Details:—

| Produce. | Possible Points. | W. D. Ponton. | E. J. Rossow. | J. Beck. | H. Franke & Sons. | J. T. Whiteway. |
|---|---|---|---|---|---|---|
| Butter | 25 | 20 | 18 | 19 | 18 | 18½ |
| Cheese | 20 | 10 | 10 | 11 | 20 | 11 |
| Eggs | 5 | 3 | 3 | 4 | 3 | 2 |
| Totals | 50 | 33 | 31 | 34 | 41 | 31½ |
| **Foods—** | | | | | | |
| Hams, bacon | 20 | 15 | 13 | 16 | 18 | 13 |
| Corned and other meats | 10 | 8 | 8 | 8 | 8 | 7 |
| Honey and by-products | 15 | 12 | 8 | 8 | 9 | 6 |
| Beeswax | 5 | 4 | 2 | 3 | 3 | 4 |
| Bread, scones | 5 | 3 | 3 | 5 | 5 | 4 |
| Confectionery and sweets | 5 | 4 | 5 | 4 | 3 | 4 |
| Home cookery | 7 | 6 | 6 | 6 | 7 | 5 |
| Lard, tallow, &c. | 5 | 4 | 3 | 4 | 4 | 4 |
| Totals | 72 | 56 | 48 | 54 | 57 | 47 |
| **Fruits, Vegetables, and Roots—** | | | | | | |
| Fresh fruits | 25 | 22 | 10 | 18 | 15 | 23 |
| Preserved fruits | 15 | 14 | 11 | 13 | 12 | 13 |
| Crystallised and dried fruits | 10 | 9 | 7 | 8 | 9 | 8 |
| Preserved vegetables | 15 | 11 | 9 | 9 | 13 | 13 |
| Fresh vegetables | 15 | 10 | 11 | 9 | 15 | 12 |
| Table pumpkins | 10 | 8 | 9 | 8 | 8 | 9 |
| Potatoes and roots | 20 | 15 | 16 | 16 | 15 | 9 |
| Cocoanuts and nuts | 7 | 3 | 3 | 2 | 4 | 5 |
| Vegetable seeds | 5 | 5 | 4 | 2 | 3 | 2 |
| Roots, all kinds | 15 | 11 | 10 | 11 | 9 | 14 |
| Home-made meals | 3 | 1 | 2 | 2 | 2 | 3 |
| Totals | 140 | 109 | 92 | 98 | 105 | 111 |
| **Grain, Etc.—** | | | | | | |
| Wheat | 25 | 16 | 16 | 18 | 23 | 6 |
| Maize | 25 | 22 | 23 | 16 | 23 | 14 |
| Barley, oats, &c. | 20 | 17 | 7 | 8 | 10 | 5 |
| Home-made meals | 10 | 8 | 9 | 7 | 7 | 7 |
| Totals | 80 | 63 | 55 | 49 | 63 | 32 |
| **Tropical Products—** | | | | | | |
| Sugar-cane | 30 | 3 | 10 | 18 | 8 | 19 |
| Cotton in seed | 20 | 12 | 20 | 18 | 18 | 16 |
| Coffee | 6 | 6 | 6 | 6 | 0 | 6 |
| Totals | 56 | 21 | 36 | 42 | 26 | 41 |

ONE-FARM COMPETITION—*continued.*

| Produce. | Possible Points. | W. D. Ponton. | E. J. Rossow. | J. Beck. | H. Franke & Sons. | J. T. Whiteway. |
|---|---|---|---|---|---|---|
| TOBACCO— | | | | | | |
| Tobacco leaf .. .. .. .. | 10 | 10 | 8 | 8 | 10 | 10 |
| HAY, CHAFF, ETC.— | | | | | | |
| Hay .. .. .. .. .. | 20 | 15 | 16 | 19 | 19 | 7 |
| Hay in sheaf .. .. .. .. | 5 | 5 | 5 | 5 | 5 | 2 |
| Grasses and seeds .. .. .. | 10 | 7 | 9 | 10 | 8 | 6 |
| Chaff .. .. .. .. | 20 | 9 | 19 | 16 | 19 | 9 |
| Ensilage .. .. .. .. | 15 | 9 | 14 | 12 | 12 | 11 |
| Cattle fodder .. .. .. .. | 15 | 9 | 10 | 14 | 14 | 4 |
| Sorghum and millet .. .. .. | 10 | 6 | 10 | 7 | 7 | 5 |
| Broom millet .. .. .. .. | 10 | 6 | 9 | 7 | 8 | 6 |
| Cowpea seed .. .. .. .. | 7 | 5 | 7 | 5 | 5 | 4 |
| Flax and hemp .. .. .. | 10 | 7 | 5 | 4 | 5 | 9 |
| Totals .. .. .. .. | 122 | 78 | 104 | 99 | 102 | 63 |
| WOOL— | | | | | | |
| Greasy .. .. .. .. .. | 20 | 20 | 17 | 18 | 17 | 13 |
| Mohair .. .. .. .. .. | 5 | 4 | 5 | 5 | 5 | 4 |
| Totals .. .. .. .. | 25 | 24 | 22 | 23 | 22 | 17 |
| DRINKS, ETC.— | | | | | | |
| Temperance drinks .. .. .. | 15 | 9 | 8½ | 10 | 8½ | 8½ |
| WOMEN'S AND CHILDREN'S WORK— | | | | | | |
| Needlework and knitting .. .. | 10 | 3 | 1 | 6 | 7 | 9 |
| Fine arts .. .. .. .. | 5 | 2 | 3 | 2 | 3 | 2 |
| Fancy work .. .. .. .. | 15 | 5 | 3 | 9 | 8 | 10½ |
| School work .. .. .. .. | 5 | 2 | 4 | 4 | 3 | 4½ |
| School needlework .. .. .. | 5 | 2 | .. | 3 | 2 | 4 |
| Totals .. .. .. .. | 40 | 14 | 11 | 24 | 23 | 30 |
| MISCELLANEOUS— | | | | | | |
| Articles of commercial value .. | 10 | 8 | 5 | 6 | 10 | 9 |
| PLANTS AND FLOWERS IN POTS .. .. | 6 | 3 | 4 | 1 | 6 | 4 |
| TIME AND LABOUR-SAVING ARTICLES .. | 10 | 8 | 6 | .. | 7 | 10 |
| EFFECTIVE ARRANGEMENT— | | | | | | |
| Comprehensiveness of view .. .. | 10 | 8 | 8 | 8 | 9 | 8 |
| Arrangement of stands .. .. | 10 | 8 | 7 | 9 | 10 | 8 |
| Effective ticketing .. .. .. | 5 | 4 | 4 | 5 | 4 | 4 |
| General finish .. .. .. | 15 | 13 | 11 | 12 | 15 | 9 |
| Totals .. .. .. .. | 40 | 33 | 30 | 34 | 38 | 29 |
| Grand Totals .. .. .. | 676 | 469 | 460½ | 482 | 518½ | 443 |

Plate 101.—1st Prize, One Farm Exhibit, Royal National Association's Show, 1928—H. Franke, Cawdor.

## SHIELD COMPETITIONS.

In addition to the prize offered for the district fruit display, three shields were provided—one each for bananas, citrus fruit, and pineapples. The details of the results of the banana and citrus shield contests are given below. Cooran won the banana shield, and Palmwoods the citrus shield:—

BANANA SHIELD.

| —— | Cavendish. | Lady Fingers. | Sugar. | Other Varieties. | Points. |
|---|---|---|---|---|---|
| Possible points .. .. | 80 | 10 | 5 | 5 | 100 |
| Cooran .. .. .. .. .. | 73 | 8 | 3 | 5 | 89 |
| Palmwoods .. .. .. .. | 67 | 7 | 2 | 3 | 79 |
| Buderim Mountain .. .. .. | 63 | 9 | 3 | 3 | 78 |
| Redlands .. .. .. .. | 57 | 9 | .. | 3 | 69 |
| Montville .. .. .. .. | 55 | 7 | 2 | 2 | 66 |
| Woombye .. .. .. .. | 48 | 6 | 2 | 2 | 58 |

CITRUS SHIELD.

| —— | Oranges. | Mandarins. | Lemons. | Other Varieties. | Points. |
|---|---|---|---|---|---|
| Possible points .. .. | 40 | 40 | 10 | 10 | 100 |
| Palmwoods .. .. .. .. | 37 | 37 | 7½ | 6 | 87½ |
| Montville .. .. .. .. | 36 | 36 | 7 | 4 | 83 |
| Gayndah .. .. .. .. | 33 | 35 | 9¼ | 5¾ | 83 |
| Buderim .. .. .. .. | 32 | 33½ | 6¼ | 5½ | 77¼ |
| Redlands .. .. .. .. | 32 | 32 | 6½ | 5 | 75½ |
| Woombye .. .. .. .. | 31 | 33½ | 6½ | 3 | 74 |
| Cooran .. .. .. .. | 23 | 21 | 4½ | 4½ | 53 |

Plate 102.—Horse Judges, Brisbane Royal National Show, 1928.
In the group are Messrs. J. I. Fanning (Townsville), J. Macdonald (Sydney), W. Milling (Sydney), Frank Howell (Sydney).

Plate 103.—Ring Officials at the Royal Show, Brisbane, 1928.
Included in the group are Messrs. P. J. Symes, H. S. Cribb, C. R. Pickworth, J. H. Fairfax, and Major-General Spencer Browne.

Plate 104.—A Close-up of the Central Trophy, Court of the Department of Agriculture and Stock, 1928, Brisbane Show.

The work of the Departmental Officers in Grain Improvment was demonstrated most strikingly in this Exhibit.

## EFFECT OF TOP-DRESSING ON WOOL.

Though there can be no question as to the added feeding value to top-dressed pastures, writes the Sheep and Wool Expert of the New South Wales Department of Agriculture, there is a good deal of uncertainty as to the effect on the wool fibre of a sheep that is run continually on pastures which have been treated to an application of superphosphate. It has been decided, therefore, to inaugurate trials in different districts as a means of collecting data on this point.

The idea is to select an even lot of sheep, wethers for preference, as they are less liable to change from year to year, and divide them into lots—one lot to be run on top-dressed pasture, and the other lot to be left on natural pasture. Certain individual sheep will be marked in each lot, and at shearing time samples of their wool will be specially taken and kept for twelve months, when wool from the same spot will be taken for comparative purposes. Results up to the first shearing in the spring will be kept for the trials about to be commenced, but it is expected that more definite data will be obtainable over the following twelve months when the manure will have had more chance of becoming effective.

# THE CULT OF THE COLT.*

By "U9L."

III.

## TEACHING TO LEAD.

Let me have a word or two to say about the bearing-reins before going further. There's not the least need to have these tight. In fact, if they are loose enough to allow the colt free play with his head, and just tight enough to prevent him throwing it straight up in the air, that is all that is needed of them. A heavy-headed horse is an invention of the devil, and there are few joys to equal the pleasure of riding a horse whose mouth is responsive to your lightest touch and wish. Tight bearing-reins are merely the mechanical equivalent of a heavy-handed rider. Some men will say the colt's mouth will have to be made tender. It hasn't to be made so at all—it'll get that way itself during the breaking process in spite of all you can do to prevent it! Why, then, add to the thing's troubles?

With some breakers, they prefer to teach the youngster to lead before putting the tackling on it. It's immaterial. I like to use the tackling first. The mere fact of putting that on, and the pulling about to which the colt is subjected during that tackling process, is all part of the tuition to lead. I don't try and cause two deaths with one missile; but I like to help to achieve two objects with one purpose. That's why I tackle first and teach to lead later. After the colt's had the tackling for a few hours, or for a day, and which has skimmed some of the fizz off his spirits, we'll teach him to lead. We're not finished with the tackling, and this is just a break in the process to interrupt the monotony of the thing.

### A Whip out of Place in a Horse Yard.

Some people use a whip to teach a youngster to lead. I don't. It's an easy way, and it impels obedience. Also, if the colt has any smouldering ash of malice in his composition that whip will fan it to a flame quickly. Anyway, apart from everything else, a whip's out of place in a horse-yard, with any class of horse or with any number. Other people teach a horse to lead by lugging it about, swinging it from side to side, coaxing and petting it till it leads. I've done that, and great was the volume of sweat which rolled from me. That's a tedious task. The best thing of the lot, in my opinion, is a length of clothes line. Tie a loop in it big enough to go over the horse's rump, one side of the loop resting on his loins and the other side of it dangling about his buttocks. Take the line from that loop through the roller, through the breastplate, and run it through the chin-strap of the halter. With the shank of the halter in your hand, and in the other the line from the loop, you're set. Let's begin.

### Soothe and Pet the Colt.

The first thing is to soothe the colt. Pet him and make him understand that line dangling about him isn't harmful. Get him at his ease and use everything you have to make him feel comfortable. Standing out in front of him you click to him with your tongue, pull lightly on the shank, and snap smartly with the loop-line. The latter is just a shade later than the former. The colt ignores the halter pull beyond stretching forward with his head; but when that line tightens on his buttocks he bounds forward. Now's your chance, and take it quickly. Point out to the colt that the bound forward was just the thing expected of him, that the line won't hurt him, and soothe the small fright which is his. That's easy, and almost before you or the colt knows it, with the judicious use of the loop, he's leading freely. By the way, and though recognising we're not all gifted, or cursed, alike, I've found that if I place the palm of my hand on a colt's forehead, leave it there a second or two and then draw it away in a lingering motion that he'll usually follow. Try it, will you, and remember that our sole object in all this exercise is to get the youngster to step over the bounds of his instinct to the extent of following us—we who are his hereditary enemy! What's your pet abomination in a leading horse? I'll tell you mine—it's an animal you have to skull-drag as you lead it. Instead of coming freely there's a dead weight dragging on the end of the reins all the time, and if you quicken your stride a fraction the horse sits back. That's awful. Most of that is brought about in the breaking in. If a man drags his colt all the time, then that colt is a dragger for life unless strenuously corrected. Please, if you have any good wishes towards me at all, teach the

* From the "Pastoral Review" for May. Previous notes on this subject, by the same interesting and well-informed writer, were reprinted in the March and August Journals from the February and April numbers of the "Pastoral Review."

youngster to step freely when you're leading it. It's easy. Once the thing is leading, don't drag him. Make him come up to his work and step freely behind you, and, greatest pleasure of all, make him walk beside you as a white man should. There's a bond of sympathy between you and a colt which isn't a skulker and who's game to face the world beside you. It's worth doing for the pleasure it brings. If you can't do it any other way, catch the rein near the bit in your left hand, reach over his neck and shoulder with your right hand, and as you step forward, leading with the left, smack him down the shoulder with a bit of a twig in your right. It's easy, and it's a lesson quickly learned. I reckon one of the prettiest sights I ever saw was a colt of my breaking in the show ring. When his rider dismounted and walked about, that colt, with his neck arched and his ears pricked, taking an intelligent interest in all he saw, stepped beside his rider. When the man stopped the horse stood still beside him, and as the man lifted his foot to step forward the horse moved with him. Honest, though he came out of the ring without a ribbon, I felt proud of that little horse.

**Use Common Sense and Judgment.**

When we've taught the colt to lead a bit we'll put him back in the yard and attach the tackling to him once more. After this has been on him a time or two it's not a bad line to substitute an old saddle in place of the regulation roller. And don't be mean about the saddle-cloth. Hang one on each side of the saddle, hang a bag across his loins or suspended from the crupper staple on each side, and the more fluttering gear you have about the thing the better it is for him. It doesn't in itself achieve any useful purpose, but it all helps to quieten him and accustom him to the foolish ways of man. But there's a medium in that also. Some horses are sulky, vicious, spiteful, and intolerant. It's not the nervous or the frightened horse to which I refer—don't run away with that idea—and the animal which I have under review is what one refers to as a hyphenated pig or a sanguinary swine. Here's the sort of thing to which I refer. One mare I was breaking in, as she ran round the yard, used to kick every time she passed at the chain on the gate. Now, it was an inoffensive chain and didn't deserve that treatment. I shifted it out of sight and pegged the gate from the outside. Did that discourage her ladyship? Only for one round was she beat. Then she picked out a certain spot on the rails, and every time she passed that spot, for no apparent reason at all, she let it have both heels. What are you going to do with a brute like that? When I tackled her she backed against the rails of the yard and, for five minutes at a spell, she'd stand in the one position with her front feet and play with both hind heels against the yard. Now it's at once apparent to you, with brutes of that sort, it's only pandering to their evil spirit and feeding their base desires when you give them any excuse to kick. Some may get a sickener of it in short order, and others will break their puny hearts and grow a canker of malevolence only against your efforts to make them tractable. You've got to use judgment in this. But in your favour rests the fact that a horse which is going to be worth while won't play the fool in vicious ignorance to any great extent, and though he mightn't submit tamely, if he's ever going to be any good at all, he's got enough sense to know what's good for him. Use judgment, sir, when you're packing your colt with flapping bags, and in all things take into consideration the temperament which is his, plus or minus, as the case may be, the mental peculiarities which are yours. I have finished, and I hope I have made myself understood.

**Getting the Colt's Confidence.**

Each time we catch the colt now, and we're doing it regularly all day long, he gets easier to catch. Even so, instead of us catching him, why not make him come to us when we want him? It's easy, not harmful, takes but little time, creates a good effect, helps to give the colt confidence, and, I think, has everything in its favour. Let's do it. When we put the colt in the round yard, or whatever other yard it is in which we tackle him, what's his first desire? I'll tell you—it's to get out again. Where does it look to get out? By the same way as that which it entered, of course—by the gate. If you leave that gate open the colt won't be two flicks of time before he's out again, and even after you shut it he'll revert to it. Let's leave it open, standing in that open gateway ourselves. As soon as the colt sees the road to freedom he comes to it, but when he sees us there he sheers off. Very well, we'll leave it open and take our stand in it. The colt wants to get through, but he's not game. He'll go and stand over on the far side of the yard, continually turning his head to the open gate, and wishing to goodness that we'd move out of the way. Half a dozen times he comes to it, and as many times he turns from us, and finally stands over on the other side of the yard. When we click to him, or snap our fingers at him, or call him by word of command, he turns his head and

wonders. He's got an inkling of what's desired, and he wants to come to us as that's his road to freedom; but he's afraid. If we can't bring him any other way we'll pick up a bit of a pebble or a lump of caked mud and throw it at him to hit him on the ribs. That's a special detestation of horses, by the way. That moves him to action and a great desire to leave his prison. The way out is open, but we're blocking it. After a bit, by the moral suasion which we exert, or by the fact the lumps of mud have made the yard uncomfortable, the colt tries to get through the open gateway in spite of us blocking the way. This is where we show ourselves in our might and strength. We step out in front of him and block him, and then by all the blandishments we possess, and feeding him all the verbal lolly and soft stuff we have in stock, do we convince that colt that he'd done the right thing in trying to get out. After a couple of times he comes to us almost of his own accord as soon as we call him, and using his own desires to cloak our purpose do we teach him to come to us when called. Do you follow my argument? Do you see the course of my reasoning? That's merely the foundation of the trick, and I leave it to your individual selves to build what fancy top-structures your desires might prompt. On a good foundation you may build high, and I know it's a solid basement which I've offered you.

## CARE OF THE FARM TRACTOR.

By G. W. WATSON, M.I.Mech.E., M.I.A.E.*

AT a Rothamsted (England) conference recently the subject of "Power for Cultivation and Haulage on the Farm" was discussed. An account of the proceedings has been published, in which the following note appeared:—

An agricultural machine or implement usually suffers from the simple fact that it is an inanimate object—i.e., it is without life or soul. Whilst most owners will give some measure of personal attention to even the meanest and least profitable animal on a farm, there are many who, having bought a machine, turn it over to a heavy-handed individual who has no knowledge of its construction, no interest in its success, and little or no inducement to acquire that knowledge or simulate an interest. Tractors may be divided, roughly, into two broad classes—firstly, the petrol or paraffin class; and, secondly, the steam class. I propose to confine my remarks to the former. If an engine starts up at the first swing and runs with a healthy purr, indicating that all is well, a driver feels that he has made a good start for the day. This feeling of satisfaction is amplified if the engine answers to the throttle and pulls in the field as though it took a real interest in its work. In the case of an engine that has been in use for any length of time these results are not obtained without trouble, but it is surprising how long an engine will keep in good condition if it receives consistent attention, and all adjustments are carried out as soon as they become necessary. Apart from the actual breaking of a vital part the diseases from which an engine suffers can be classified, roughly, under the general name of troubles, as follows:—Ignition, fuel supply, lubrication, valves, and water circulation. To this list of evils may be added knocking or noisy sounds, which are not evils in themselves, but are simply warnings that all is not well.

### Ignition.

It is of vital necessity to keep the coil or magneto free from damp, because if the condenser becomes damp it will not only cause leakage and failure of the ignition, but will not hold any charge, and the resulting spark will not be efficient. Great care should always be taken to avoid spilling water over either coil or magneto, and should any be spilt thereon it should at once be mopped off, and, if necessary, dried off by warm air from a lamp or stove, but care should be taken not to raise the temperature of the part so much as to melt the wax or shellac insulation.

I will now deal with some of the more common troubles experienced with ignition systems. The driver who knows his engine occasionally detects an alteration of its note or an interruption of its regular hum. This, if accompanied by a falling-off in power, is probably due to occasional or persistent missing of one of the plugs. When compression taps are fitted it is easy to locate the faulty plug. If all the plugs are firing badly the fault may be either in the petrol supply or in the ignition. If only one plug is missing the trouble can at once be set down to ignition alone, or, on

* In "The Australasian," 18th August, 1928.

rare occasions, to a valve being stuck open. Apart from actual damage to a plug by breaking the porcelain or other insulation, there are three main evils from which it may suffer. Short-circuiting may take place between the points and the body, due to the hot spark having melted the metal. The gap of the plug may be too wide; it should not be more than about 1-50th of an inch, or, roughly, the thickness of the average thumb-nail. If the engine misses when running at small-throttle openings the points of the plugs should be set a little farther apart, whereas, if missing takes place at full-throttle openings the points should be set closer together. The third evil is due to sooting up, and is cured by cleaning with a little petrol. An occasional cause of missing is through having the points set in a pocket in the valve cap. This pocket remains full of spent gas left during the exhaust stroke, and a considerable improvement can be obtained by fitting plugs with a longer reach.

**The Magneto.**

The magneto may be the cause of irregular firing in any or all of the cylinders, but tampering with a magneto is a pastime not to be recommended unless a driver understands it. There are two points, however, to which occasional attention is required; these are the high-tension distributor and the contact breaker. This distributer disc should be cleaned occasionally with a cloth and a little petrol, and the disc wiped over afterwards with a trace of oil. The contact breaker is the most important part of the mechanism. The space between the platinum points when they are separated should be about 1-64th of an inch, and any variation from this may cause ignition trouble. The contact points should be trimmed when necessary with a very fine file, so that they bend together level when closed, but they should not be trimmed unless the points are uneven. Oil should not be put on the platinum contacts or it will cause them to burn away rapidly. Occasionally the lever to which the moving point is attached works stiffly, allowing the points to remain apart; in such a case the fibre bush should be eased slightly. Oiling is of no use, as it may make it swell more. If these various points receive proper attention there is little to go wrong. A few warnings concerning magnetos:—

Don't run the engine with a plug wire disconnected—you may ruin the insulation. If you want to cut out a cylinder short-circuit the plug—that is, connect it directly to the metal of the engine.

Don't swamp the magneto with oil; two or three drops of good oil once a week are sufficient.

Don't oil the contact breaker.

Don't use an oilcan with dirt on the spout.

Don't file the contacts more than is absolutely necessary.

Don't hold the contact breaker to prevent the spindle turning when tightening up the nut of the driving coupling.

Don't fail to see that the earth wire is not making a short-circuit.

Don't hang plug cables on the exhaust pipe.

Don't replace plug wires on the wrong terminals.

Don't tamper with a magneto unnecessarily.

**Motor Fuels.**

Every driver knows that if petrol is poured on the hand it evaporates with a marked cooling effect, due to the petrol extracting heat from the hand. In a carburetter fuel is supposed to be split up into a fine spray, and the heat for its vaporisation is extracted from the air. Any cracks or leaks in the pipe which heats up the air to the carburetter should be repaired at once. The jets in a carburetter are usually very small, and it is very necessary that all the fuel should be carefully filtered before it is put into the tank; as an additional precaution there should be a filter between the tank and the carburetter. These filters should be cleaned regularly, and any drops of water found therein carefully blotted up. "Popping back" into the carburetter indicates a weak mixture, and is one of the first symptoms of fuel-supply trouble. Such a mixture burns slowly, and may still be burning when the inlet valve opens, thus allowing some of the burning gas to rush back into the carburetter. If the engine has been running normally and popping suddenly develops, look for some stoppage in the fuel supply. First try the float needle, and if the petrol does not flow into the float chamber, although there is plenty in the tank, there is undoubtedly a stoppage in the pipes or the filter, both of which should be thoroughly cleaned. Such stoppages are frequently caused by small particles of scale from the tank, pieces of waste or fluff, or by drops of water which

will not pass through the filter or the jets. Many engines have a tendency to pop back when first started, from cold, but work satisfactorily after they have run a little time and become warm. The explanation of this has already been given in the paragraph dealing with hot-air supply.

Occasionally a float sticks or is held up by grit, or the needle becomes bent or jammed, causing the carburetter to flood. Flooding may also result from a punctured float, in which case the petrol can be evaporated and driven off by immersing the float in hot water, and at the same time the issuing bubbles will show the position of the hole, which should then be soldered neatly, or, in the absence of solder, a temporary repair can be made by wiping a piece of soap over the hole. A leaky joint in the inlet pipe may cause much trouble by weakening the mixture, and in an old engine leakage of air along the valve stems, due to wear in the guide, may have the same results. All joints should therefore be kept tight and leakages stopped as far as possible.

Very briefly, fuel-supply troubles and their remedies may be summed up as follows:—

Engine Pops Back and Stops.—No petrol in tank, petrol pipe choked, filter stopped up, or water in petrol.

Engine Pulls Badly on Hills.—Insufficient heating or jet too small.

Engine Flabby and Exhaust Offensive.—Jet too large, causing rich mixture.

No Acceleration and Engine Staggers when Throttle is Opened.—Engine cold or mixture too weak.

Carburetter Floods.—Needle valve sticking, dirt under needle, valve or float punctured.

Consumption Excessive.—Engine or transmission in bad condition, jet too large, ignition retarded, leakage of petrol, or brakes binding.

Let me here give a word of warning to drivers. A carburetter is a delicate piece of mechanism, but if properly fitted and treated carefully it rarely gets out of order. No driver should be misled by an engine knock to believe that there is something wrong with carburetter, as in no circumstances can this be the case. Again, many drivers always blame the carburetter if an engine suddenly heats up, whereas the probable cause is that the fan belt is slipping, that there is no water, that the water-jacket is choked up, that more oil is needed in the crankcase, or because the ignition is retarded too much. Overheating is never caused by too much gas.

## Lubrication.

Lubrication means the introduction of a separating film of oil or grease between two parts of a machine which have movement one upon the other. If the moving parts make actual metallic contact the surfaces will soon become roughened to such an extent that they may seize. The higher the speed of rubbing the sooner seizure will occur, and its consequence will be more serious. Some parts of motor vehicles are designed so as to create friction, but such parts are few, and are for special purposes —such as the main clutch, the brakes, the fan belt, and the tyres. Of all the sources of friction in an engine that of the piston against the cylinder wall is the largest item, and is double or treble the total friction of all the other parts of the engine put together.

## Valve Troubles.

Valve trouble is usually indicated by a gradual falling off in power. On examination the valve faces will be found scored and pitted, and it is necessary to grind them down on to their seats to again produce a clean face. If the face is very deeply pitted it may be necessary to clean it up in a lathe, after which it should be ground to a true bed on the seating. In an old engine the seatings themselves may become rough and necessitate truing up with a special tool, or, if not too bad, an old valve can be used for this purpose with a slightly coarser grade of emery, finishing off with fine emery and the proper valve. The operation of grinding is a perfectly simple one, but requires to be done with care. Only the very finest flour-of-emery powder, mixed with lubricating oil to form a thin paste, should be used. This should be spread evenly on the valve face, and under a slight pressure the valve turned first in one direction, then in the other, occasionally lifting it and turning it through about half a turn before letting it drop on the seat again. This is to prevent the emery getting into tracks. If a light spring is slipped under the valve head, and is long enough to lift the valve from its seat, it will be found a great convenience, as on relieving the grinding pressure the valve will be lifted and

it can then be twisted as much as is necessary before pressing down again. The exhaust valves suffer most, due to the hot gases sweeping across their faces, and it is for that reason that one usually allows a little more clearance for the exhaust valve tappets than for the inlet valve tappets so as to make quite sure that the valves really do close. When grinding in valves, it is, of course, necessary to take care that none of the emery paste enters the cylinder or gets on the valve stem, and the valve, valve port, and guides should be thoroughly cleaned before assembling the parts, oiling the valve stems during the process. After regrinding valves it is usually necessary to readjust the tappet clearances, carefully tightening up the lock nuts so that they cannot work slack. Each valve should be examined in turn to make certain that it is never held off its seat, nor has too much clearance—the clearance should never be less than 1-64th of an inch, and never more than about 1-32nd of an inch—but in order to get the quietest and best running it is advisable to adjust the tappets while the engine is still hot and the valve stems expanded to their maximum amount. It is not always easy to see if the clearance is right, especially if the head of the valve tappet is much bigger than the end of the valve; the tappet head may be a bit soft, and the end of the valve then punches a slight depression into it, so that the clearance is really more than it appears to be. It is, however, always preferable to have too much rather than too little clearance, as, although the engine will be noisy, there is less fear of burning out of the valves.

If for any reason a camshaft has to be removed careful search should be made for any marked teeth, and care exercised that the teeth of the timing gears are again correctly meshed when putting the camshaft back again. Occasionally a valve sticks in the guide, due to insufficient lubrication, or it may be that the valve stem has warped. If a spot of oil on the stem is not sufficient to make it operate again the valve should be removed and the stem rubbed down with a piece of emery cloth, or, if badly warped, carefully straightened in the jaws of a vice, after which it may be necessary to regrind the valve on to its seat. If the engine is provided with screwed valve caps the threads should be smeared with graphite and oil before replacing the caps, otherwise they may seize and be very difficult to remove. A driver should make quite sure that these are screwed up quite tight and that there is no leakage. A simple test for leakage is to pour a little oil round the joint when the engine has been started, when any leakage will be at once apparent by the oil being blown away from the joint.

### Cooling.

In small engines it is possible to rely on air-cooling, as on motor-cycles, but in larger engines a water-jacket is provided, and water circulated through this either by pump or natural circulation. In most cases it is usual to provide a fan to assist the cooling of the water as it passes through the radiator, and the fan belt should be kept at the proper tension, otherwise there will be slip. Water-cooling troubles make themselves evident by steam being generated, but so long as steam is not blowing away, even if the radiator is uncomfortably hot to the hand, there is no danger, as an engine works best when the water is just below boiling point. Like most complaints of engines, overheating may be of gradual growth, or it may develop suddenly. In the former case it means that the water-jackets and radiator have become coated with scale such as we find in a domestic kettle, except that the scale may also include rust and grease. Scale interferes with the passage of heat to a very great extent, but much of it may be removed by filling the jackets with a hot, strong solution of common soda, then, after leaving it to stand all night, drain it off and thoroughly wash out with clean water. Soda must not be used if the radiator or pipes are made of aluminium, because soda is injurious to this metal. In such a case it is better to use boilerine tablets or a solution of carbon tetrachloride. If overheating shows up suddenly on an engine that has previously given no trouble we must look for a broken or slack fan belt, a faulty pump, or leaking joint allowing water to escape, or the accidental opening of a drain tap. The most serious cause of overheating, however, is a cracked cylinder, as a very minute crack will allow gas to escape from the cylinder into the water-jackets, and the water will quickly boil. Some drivers appear to have difficulty in making tight joints in rubber connections, but if a little rubber solution is smeared on the pipe it will not only act as a lubricant, but when it sets it will ensure a good joint.

### Transmission Gear.

The transmission gear commences with the clutch and finishes at the road wheels. The two main portions of a clutch should disengage positively when the clutch is out, so that there is no dragging on the gear-shafts. If the clutch becomes greasy it

will slip, causing heating, and probably burning the lining, while if it is allowed to become fierce it makes starting difficult and throws undue load on the transmission system. A slipping clutch may be caused by insufficient spring pressure, the lining being badly worn, or worn so as to leave a ridge which prevents the cone entering any farther, in which case the ridge can be removed with a chisel, sharp knife, or file. If none of the above causes is present but the clutch still slips, a new lining should be fitted as soon as possible. Meanwhile, as a temporary expedient, thin strips of metal can be inserted underneath the lining between the rivets. A fierce clutch may be caused by too much spring pressure or by the rivet heads standing proud of the lining, in which case the clutch will slip a little at first and then take up suddenly. The remedy is to drive the rivets farther in with a punch, so that they are below the surface of the lining. Another and frequent clutch trouble arises from the centre or spigot bearing becoming so worn as to allow the clutch cone to sag and fall out of truth with the flywheel. This makes gear-changing a very difficult matter, because the clutch is never really free. If a clutch slips badly the first thing to do is to wash the lining with petrol, and if the lining is of leather it should then be reconditioned by dressing it with castor oil or collan oil and leaving it to stand disengaged overnight, so as to allow the oil to soak in. If, however, the lining is of fabric no oil should be put on it. As a temporary measure for a slipping clutch it should be dusted over with fuller's earth, or, in the case of a fierce clutch, with powdered graphite, or French chalk.

Multiple-disc clutches are now frequently used, some of them being enclosed in an oil bath whilst others are of the dry type. In the oil-bath type the case should occasionally be drained and washed out with paraffin and new thin mineral oil then put in. If thick oil is used it is liable to become sticky, and may cause slipping, whilst mixtures of engine oil and paraffin should never be used. Between the clutch and gearbox many vehicles are provided with a small brake or clutch stop, the object of which is to bring the rotating parts of the gearbox to rest when the clutch is out, so as to make gear-changing easy. Attention should be paid to this small brake to see that it is neither too fierce nor too slippery. The next link in the transmission is the change-speed gearbox. It should be supplied with the right quantity of suitable oil and occasionally drained, washed out with paraffin and a supply of fresh oil then added. This cleansing and replenishing is necessary because, no matter how carefully used, fine particles of metal dust or chippings become separated from the gears, bearings, change speed forks, &c., and if allowed to accumulate they cause extensive damage. The ideal lubricant is a good heavy mineral oil, but unfortunately some boxes will not retain it, and in such cases it is a common practice to mix oil and grease together; neither must be of the kind which produces a soapy mixture, because this implies the presence of acid, which will etch highly polished surfaces and cause damage. As a general rule the thinnest mixture of lubricant the box will retain should be used, not only because it flows freely to every part, but because it offers less resistance to the gears.

From the gearbox the drive is transmitted to the driving wheels through chains or a propeller shaft to the rear axle. If chains are used it is useless to attempt to lubricate by pouring oil on to them. The only effective way is to remove the chains, wash them thoroughly in paraffin, drain them, and then soak them in a bath of hot grease and graphite, and again drain them. Any excess of grease should then be wiped off, or it will collect dust and grit. If chain-cases are provided they should be maintained in an oil-tight condition, and the oil kept up to the proper level. The chains should be kept at a proper tension—a little slack, but not slack enough to flog. If universal joints are not properly lubricated wear will take place, and backlash develop and damage all keys and gearing. The back axle or differential case requires the same attention as is given to the gearbox. If pieces of metal are found on filtering the oil drained from casings something is wrong, and the matter should be reported at once or serious damage may follow.

**Conclusion.**

As a final word let me add that the best possible way of reducing the cost of maintenance of a tractor is by giving close attention to the matters which I have mentioned. If this is done, and the brakes and steering connections are kept properly adjusted and all nuts and bolts kept tight, there is little to go wrong in a modern machine, apart from fair wear and tear, calling for the replacement of worn parts by new ones. If the care which I have advocated is not given reguarly abnormal wear and tear will take place, heavy costs for renewals will be incurred, and the value of the machine will rapidly depreciate. I would again urge owners of tractors to treat their machinery as they would treat their animals. If they do so they will find themselves well repaid.

# SAVING TIME IN TRACTOR PLOUGHING.

## HOW TO LAY OUT IRREGULAR FIELDS.*

In accomplishing the world's greatest task—that of ploughing the soil—adverse conditions are more often met with than those which are ideal. It is one thing to turn a large acreage during the first few days with a tractor ploughing outfit in a large, level, and regular-shaped field. To secure a high average daily performance for the completed job with the same outfit in a hilly and irregular-shaped field is quite another matter. A careful study of any given field with reference to the best way to lay it out for tractor ploughing will pay big dividends in quality of work for the finished field, saving of time, and lessening the wear and tear on the machinery —not to mention the added satisfaction to the operator. The writer has given close study to this problem for many years. The result of this study has been the development of a simple method of laying out fields which is applicable with equal facility to all manner of fields as regards size, shape, and topography. In short, it has become generally recognised by the power farming fraternity as the most satisfactory method yet devised, and is so recommended by all the manufacturers of tractors and tractor ploughs who have given the method a fair comparison with other methods. It offers a workable way to plough any field to satisfactory completion, which is at all adapted to power farming. With the newer and more powerful tractor models now coming out, there are very few fields which cannot be tilled with mechanical power. The method, in brief, is a plan of ploughing around the field instead of "in lands." Hills and irregularity of shape offer no obstacles, as we shall see, and under seemingly very bad conditions, the field can be ploughed economically with a tractor outfit.

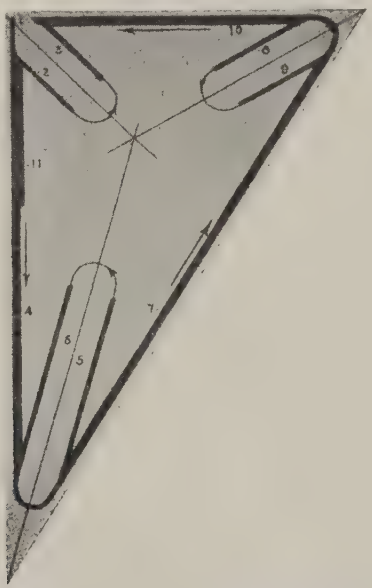


Plate 105 (Fig. 1).—Showing how a Triangular Field is Laid out, with Location of Turn Strips. Consecutive Furrows are Numbered.

### Horse Ploughing.

Any farmer who has used horses for ploughing, following the usual custom of beginning at the outside of the field and going round it continually until finished, knows the following facts about this method of horse ploughing:—That it is the quickest way to plough any field completely; that one will always finish in the centre of the field, regardless of its size and shape; that there will be no odds and ends left to plough afterwards; that it makes the least number of back furrows and dead furrows; that it requires no need for staking out and measuring distances; and that its main objection lies in the fact that the horses tramp the life out of the freshly turned soil in the turn rows which lead away from each corner.

* Reprinted from "The New Zealand Farmer" for August, 1928, and taken originally from an article by J. L. Ahart, in "The Field Illustrated" (U.S.A.).

**Power Ploughing.**

The same man will recognise as the chief limitation of a tractor ploughing outfit its inability to turn an inside corner successfully with the plough in the ground after the first round is made. He will say that tractor ploughing would be idea if this problem were solved—if one could plough around a field with a tractor, and at the same time eliminate the one serious objection he has to this method of horse ploughing. In some communities, the horse farmers consider the packing of the soil in the turn rows a very serious objection, and for this reason they plough their fields by marking out lands and ploughing each of these separately, even though they lose the many advantages of ploughing around the field. The power farmer has generally used the same method of ploughing out lands with his tractor from the start because he has known no other way to meet the difficulty just mentioned. Another reason why tractor ploughing is almost always done by cutting up a field into lands is that the thousands of tractor-interested farmers who have attended the many large tractor ploughing demonstrations held during recent years have always observed that the demonstration ploughing was always done by this method. It was natural for one to think that if a better method of ploughing existed, the manufacturers of tractors and ploughs would surely use it for sales demonstration purposes.

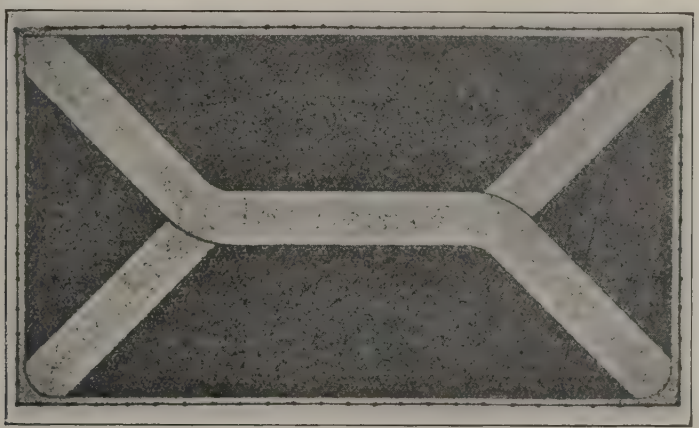

Plate 106 (Fig. 2).—Turn Strips in Rectangular Field.

**Limitations of the Machine.**

The power farmer who has used his tractor by ploughing out lands knows the faults and limitations of the method. He knows, who should know, the cost in loss of time that results from travelling a number of times over the same ground on the head lands with the plough out of the ground. This loss can easily amount to 10 per cent. of the total time spent in ploughing the field. He knows the difficulties which are sure to follow if the lands are not accurately staked out, one of which is the inevitable floundering around on the ploughed ground with the outfit to finish the point rows in midfield. Perhaps he has given up trying to do a neat job of ploughing with the tractor in his more irregular shaped fields and use a horse plough to finish up the odds and ends. When the fields are undersized and very irregular, would it not be best to do the whole job with the horse outfit, he comes to ask himself. And he finally does it as a matter of better judgment. If we accepted the method of ploughing out lands as the best way to use a tractor ploughing outfit we would not be keeping pace in this important regard with the rapid advance which has and is signalising the tractor farming industry.

Through experience as a farmer in a hilly section of the country, the writer has met about every problem which can confront a man while ploughing with a tractor. He realised some years ago while demonstrating for one of the largest manufacturers that something different would have to be done if the power farmer was to have a method of ploughing which he could use in all his fields, regardless of their size and shape. To be definite and usable, any new plan would have to be based on true engineering principles and yet be so simple that the average operator could appreciate its advantages after a single trial. Ploughing around the field offered the

necessary advantages. It only remained to solve satisfactorily the corner problems of a tractor outfit. Strangely enough, it was while serving as a field artillery officer in France that the writer hit upon the simple idea which was put to use immediately upon returning to the farm and made to serve as the basis of a new and better method of laying out fields, which for want of a better name has become known as the Ahart method.

When a field is ploughed by going around it, the turn rows always exactly bisect the corner angles and these turn rows always meet in the centre of the field area. Now instead of attempting to make the corner turns with the plough in the ground, why not determine beforehand where the turn row will fall, mark the turn row off suitably, and lift the plough as the turn is being made. If we mark off by ploughing a shallow furrow a turn strip which will bisect the corner angle, the plough may be lifted as it comes up to the mark furrows each time and effect a neat job. It can be dropped into the soil again at the shallow furrow which marks the other side of the turn strip. If the ground is covered with much trash or a cover crop, simply running the tractor through the weeds or growth will serve as a mark. The turn strips are ploughed out after the body of the field is completed.

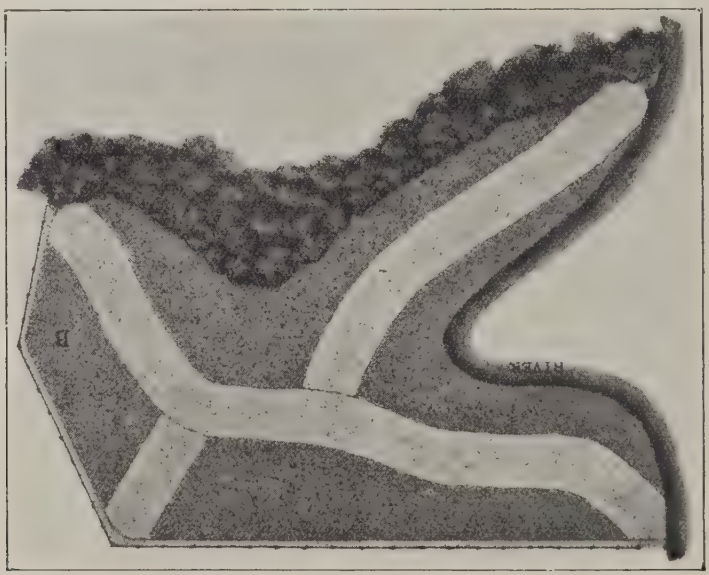

Plate 107 (Fig. 3)—Turn Strips in Irregular Field.

**A Simple Method.**

To locate the turn strip accurately a very rapid and simple method is used. The operator stands in the corner and measures the angular distance between the fences forming the corner. This may be quickly done by extending the arm horizontally and using the breadth of the hand as a measure on the horizon. After finding the number of times the breadth of the hand will lie on the horizon between the fences, the half number will obviously locate the bisecting point. Some well defined object in the distance will be on or very near the bisecting line and this is taken for a guide when marking out the turn strip. There is no pacing or staking necessary. The determination may be made from the tractor platform if the machine is stopped in the corner and it requires only a few seconds. The turn strip should commonly be made about 35 feet wide, although this will be determined by the turning radius of the tractor and whether the ground is on a slope. The idea is to have the necessary width so that a comfortable turn can be made. The steeper the slope the wider the strip should be made to allow for the tendency of the outfit to slide while turning. All the turn strips are laid out for a few hundred feet away from each corner while the first or second round is made. Afterwards, the turn strips are extended as the field is brought to completion, and they will meet in the centre of the field.

By referring to Fig. 1, in which the furrows are numbered consecutively as they are ploughed, it will be seen just how the field is laid out and the ploughing started without any lost time or unnecessary travelling. Figs. 2 and 3 show the location of the turn strips in a rectangular and very irregular field, respectively. It is noteworthy that if the two fields shown in Figs. 2 and 3 have the same area, they will be ploughed in the same time by this method. In the case of the field in Fig. 3, tractor ploughing would more than likely be disappointing in point of time consumed and quality of work if ploughing "in lands" is attempted. Note also that no turning is done on the same soil twice. This does away with objectionable packing, especially when the soil is damp. Furthermore, if the plough should not function properly when being dropped in at the farther mark furrow, it will not matter, as the next time around will work out the irregularity on account of the furrows constantly getting shorter. When this occurs while ploughing "in lands," the irregularity stays in the furrow until the finish where it leaves a patch that is difficult to finish neatly. Figs. 2 and 3 also show the proper relation of the turn strips for rapid ploughing out to finish the field. The general rule is to combine the turn strips for ploughing out whenever possible. With this in mind, the shorter legs are ploughed out first so that the turns at the inside end can be made on the unploughed land of the main combined turn strip. The amount of dead furrow will only be the length of the turn strips. When ploughing the next time, a strip is back furrowed around the outside of the field to keep the soil level along the fences. This is easily accomplished as one may go around the field in either direction after this method. Also, the turn strips may be laid out the second time slightly to one side of the previous ploughing in order to fill the old dead furrows.

When once the simple fundamental details of this method are learned in practice, the method will be found equally adopted to any field, and the saving in time and fuel will be very noticeable over any other method of ploughing. The only condition yet found where the method is not advisable is in the case of low, poorly drained land where many dead furrows are wanted for drainage.

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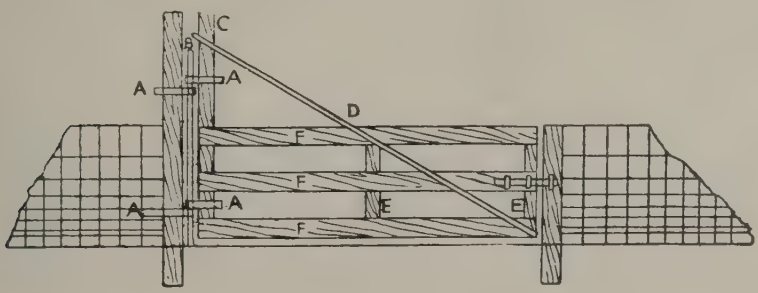
## A SIMPLE AND SOUND GATE—MADE ON THE FARM.

The construction and the satisfactory maintenance of gates, especially where the number of them necessarily is large, represents a big problem on the farm. Perhaps the above sketch from an American agricultural newspaper will afford




some ideas to readers. The description of the parts is as follows:—AAAA, four eye-bolts, made from ½-in. round iron, with threaded ends for nuts, and eyes large enough to admit a ¾-in. water pipe or rod. The eye-bolts in the framing post, C, of the gate rest upon the eye-bolts in the fence post upon which it is hung, forming a hinge. B is a piece of ¾-in. pipe used for a hinge pin, not fastened anywhere, one end resting on the ground. C is the framing post, 4 by 6 by 8 ft. long. D, the brace rod, is made from an old piece of ½ in. pipe, with a nut at upper end to draw up gate when desired. EE are two framing pieces, 2 by 4 in. F is 1 by 6 by 12 ft. boards, making the gate 12 ft. wide. For the fastener the maker used a piece of ½ in. round iron, drove a large staple in the fence post, and two in the gate, making a regular bolt. Then he gave the gate and all the trimmings plenty of paint. The post on which it is hung is a good, heavy one, 5 ft. in the ground, with plenty of stone tamped in around it, and then poured full of cement.

# TRADE CLASSIFICATION OF PIGS.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

*To secure the maximum profit in the production and marketing of various grades of pigs, it is essential that the farmer should have a detailed knowledge of trade classification, and of the requirements of the buyers representing both proprietary and co-operative bacon factories, the fresh pork trade, shop and retail trade, or the general buyer who attends and operates at store or market pig sales. The requirements of fellow farmers who depend to an extent upon the purchase of store pigs for further fattening are worth careful study; while in the stud pig business one needs quite an expert knowledge of the various breeds and of breeding and feeding, together with an equally extensive knowledge of the exhibition of stud pigs at shows, and of the business side of the trade in so far as it relates to membership in the Stud Pig Breeders' Society, correspondence, recording of pedigrees, advertising, despatch of selected pigs, and so on. These and other interesting points are discussed again by Mr. Shelton in the following article, which is largely a reprint (in response to numerous requests) of notes on the same subject which appeared in the Journal for August,* 1927.—*Ed.*

To secure the greatest margin of profit in the actual marketing of the animals it is necessary that they be properly developed and "topped up" on suitable and sufficient foods, this especially so three weeks or more before actual despatch, and that at the time of final preparation for marketing they be correctly classified and graded. The final preparation for market is particularly important, as on this so much depends; nothing is more annoying than to see well bred and well fed pigs offered for sale in a filthy condition, covered with mud (and sometimes with parasites such as hog lice) and confined in pens equally muddy, filthy, or dusty.

It is the right of every producer to see that the goods he has to offer for sale are placed before the buyers in the most attractive manner possible, and that they be delivered with all care and expedition to the buyer at point of local or terminal despatch.

## Market Classification.

In the actual sale of pigs by public auction or private treaty, a number of different grades are provided for, each of which has its own particular classification, the pigs being graded according to quality, approximate age, estimated or actual live weight or estimated or actual dressed weight (as the case may be), and approximate value.

The following table, which sets forth the names, ages, approximate weight, and value of market pigs will therefore be found very useful as a guide in the actual preparation of these animals for disposal and despatch. The figures quoted are approximate only, as trade requirements vary from time to time, and in different districts, States, and countries; they are quoted more as a guide than as a price schedule.

The demand for pigs of all ages and grades is being well maintained, and there appears to be no occasion to suggest a weakening of the demand, since as yet our local markets are not continuously fully supplied, and as yet we have no regular export of bacon and ham, or of frozen or chilled pork to markets overseas. Indeed, there has been quite an appreciable import of pig products from New Zealand, and this matter is the cause of some concern both here in the North, and in the Southern States.

TRADE CLASSIFICATION, QUEENSLAND, AUGUST, 1927.

PIGS.

| Name or Grade of Animal. | Approximate Age. | Approximate Weight. | Approximate Value per Pig. |
|---|---|---|---|
| Sucker or Sucking Pig .. | 6 weeks .. | 15 lb. dressed .. .. | 10s. to 12s. 6d. |
| Weaner Pig .. .. .. | 8 weeks .. | 25 to 30 lb. alive .. | 15s. to 20s. |
| Slip Pig .. .. .. | 10 weeks .. | 30 to 35 lb. alive .. | 20s. to 25s. |
| Store Pig .. .. .. | 12 to 14 weeks | 45 lb. alive .. .. | 20s. to 35s. |
| Light Porker .. .. | 4 months .. | 50 lb. dressed .. .. | 40s. to 50s. |
| Medium Porker .. .. | 4½ to 5 months | 60 to 70 lb. dressed .. | 50s. to 60s. |
| Heavy Porker .. .. | 5 to 5½ months | 80 to 85 lb. dressed .. | 55s. to 60s. |
| Light Baconer .. .. | 5½ to 6 months | 86 to 94 lb. dressed .. | 55s. to 65s. |
| Prime or Medium Baconer .. | 6 months .. | 95 to 120 lb. dressed .. | 65s. to 78s. |
| Heavy Baconer .. .. | Up to 9 months | 1st Grade—121 to 135 lb. dressed; 2nd Grade—136 to 145 lb. dressed; 3rd Grade—145 to 260 lb. dressed | from 50s. to 80s. |
| Backfatter .. .. .. | Up to 4 to 5 years | Up to 4 cwt. dressed .. | £3 to £4 |
| Stag.. .. .. .. | Up to 6 to 7 years | Up to 4 cwt. dressed .. | £1 to £3 |
| Chopper .. .. .. | Up to 2 years or more | Up to 3 cwt. dressed or over | £2 to £5 |
| Boar .. .. .. .. | Over, say, 5 to 6 months | Various weights .. | Boars are of little or no value as "meat" pigs |

While it will be noted that values fluctuate a good deal, and while pigs of one grade might readily be included in another and perhaps better grade, it can be taken as a general rule that the principal demand is for the medium or prime weight animal, whether marketed as porkers or baconers, or included in other grades. There is with us here, in the North particularly, a very limited demand for very light porkers or very heavy pigs of any grade. The prime pig in good marketable condition with a firm yet mellow flesh and firm white fat is the one most in demand, and is one that under normal conditions is the most profitable.

## GENERAL DESCRIPTION OF MARKET AND STUD PIGS.

### Suckers or Sucking Pigs.

This is a trade class, and includes pigs up to six or even eight weeks old, in good marketable condition and fit for immediate slaughter as "sucking pig" for the week-end, Easter, or Christmas menu, &c. The demand for this class varies considerably with seasonal and local conditions, and is not sufficiently constant or lucrative to warrant being specially catered for by the farmer resident outside the metropolitan or city areas. Pig breeders having this class of pig for sale at Christmas (and "sucking pig" is, where finances will allow, almost a national addition to these menus) can usually dispose of them at remunerative prices with but little trouble. The most popular weight is 15 lb. dressed, although some customers ask for lighter or heavier weight carcases.

### Percentage Deduction.

In general the difference between actual live and actual dressed weight—where the animals are weighed, slaughtered, and weighed again within two or three hours—varies from about 18 to 25 per cent. Most factories, however, find it necessary in actual practice and in ordinary routine to deduct much heavier percentages than these, up to 30 per cent. being a common deduction where the time elapsing between weighing alive and weighing when dressed covers twenty-four hours or more, and where there is a good deal of shrinkage in weight, the result of handling, sometimes rough handling, and transport over long distances to destination, and possibly a "rest" period of twenty-four hours more or less between arrival at the factory and actual slaughter.

Further details in regard to this portion of our subject may be had from the pamphlets dealing with "Marketing Pigs," which, together with many other nicely illustrated informative pamphlets on pig raising, are available gratis on application (written or personal) to the Department of Agriculture and Stock, Brisbane, Queensland. The various bacon factories will also be pleased to advise pig raisers in regard to any of these matters, as it is in their interests that their clients should be informed as fully as possible in regard to all matters associated with marketing &c.

**Weaners.**

Dealing further with the various grades of pigs, we come to the trade class referred to as weaners. Pigs are usually weaned off the sow at about eight weeks of age. This is the corect age for weaning, though pigs benefit considerably by being allowed to run with the sow until the age of ten weeks. At this age they are sufficiently advanced (or at least they should be) to be able to care for themselves.

PLATE 108.—ALL AMONG THE PIGS.

A Pig Farm Scene in the South. Mr. A. N. White, of the Blakeney Stud, with a group of Poland-China and Berkshire Pigs, in one of the grazing areas attached to the Stud.

They should, however, have been taught to feed from a trough when four or five weeks old, so that by the time they are ready for weaning they will be quite accustomed to their own food trough and the class of food on which they are to be fed from then onwards.

Weaners are not a "trade" class in saleyards as far as butchers are concerned, but farmers trade a good deal with these young pigs, though even for this purpose slips or stores are a better line. It is not a good thing to wean pigs off their mother hurriedly and rush them off to the saleyards, as they frequently become so checked in growth as a result of the altered conditions that they fail to develop properly and become slow growers or even "stunted" pigs. Many young pigs are rushed off to the saleyards at six weeks old, and change hands at 15s. to 20s. each, a price that is scarcely a payable one to the buyer, unless he knows how to handle these pigs to prevent a check in their growth. It is but natural for a very young pig to fret for its mother at this age, and this fretting and fuming (crying as it were) all day long soon upsets the animal's nervous and digestive system with ill results. It is preferable to hold young pigs at this age for at least two weeks more before selling, as this enables them to become accustomed to the new conditions and the absence of the sow's milk from the daily menu. Pigs vary a good deal in weight at this age, some exceptionally well-grown animals weighing as much as 40 lb. or more alive. However, the general average would be about 25 to 30 lb.

**Slips.**

After passing through the weaner stage and having been definitely separated from the mother, the young pig next becomes entitled to the trade term of a "slip." This is purely a stock salesman's or stockyard term, indicating that the pig is midway between the weaner and store stage. Many farmers prefer buying slips or stores, and growing and fattening them for market in preference to breeding them. Thus it is that there is usually a fairly keen demand for slips and stores, and thus also it often happens that they realise more in comparison than pigs that have already been fattened as light porkers. A "slip" is not a butcher's pig, and butchers do not handle them, except for fattening purposes. Most country butchers run their own piggeries, and they frequently have pigs of this description for sale. The value varies with the demand, but well-developed slips should be worth from 20s. to 25s. or more, if they have been well cared for from birth and are well bred. A little extra care in their preparation for sale and a little advertising as to their breeding, &c., helps considerably.

Plate 109.—An Attractive Trio of Berkshire-Tamworth Cross Baconers, Prize Winners of the Best Quality.

The Property of Mr. P. Fett, of Westbrook Crossing, Queensland. These would be classed as Prime Baconers in the markets of the North, and as Light to Medium Baconers in the markets of the South.

With good feeding and management it should be possible to get pigs of this quality to Prime Bacon Standard at five months of age.

**Stores.**

Passing through the weaner and slip stages, the young pig next becomes a "store pig," a stockyard term indicating, as it does in most other classes of live stock, that the pig is at an age when the owner must determine the animal's future, whether he or she is to be kept for breeding purposes, to be fattened as a porker, to be still further grown and fattened as a baconer, or to go into the heavier grades, or whether the pigs will be held for a week or two and be resold in the same grade to some other person or firm. The demand for store pigs for fattening purposes continues to increase annually, hence, provided that store pigs are in good, healthy, growing condition and show some breeding and quality, they can usually be disposed of to advantage by public auction at pig saleyards or by private contract, at prices varying from 20s. to 30s., or even 35s. to 40s. each. Store pigs to realise maximum values must be perfectly healthy, show good breeding and type, and be in clean, attractive condition ready for further development and fattening. Any "weedy" sorts or any pigs that have been injured in any way or are smaller than the others in the same pen should not be offered for sale in the same pen, as they will always affect the value of the other pigs offered, or of the better class pigs available. Suburban and metropolitan pig farmers, proprietors of "butter-milk" or "whey" piggeries (i.e., piggeries where butter-milk or whey are the principal items of purchased food) are constantly on the lookout for good lines of store pigs. They usually have no objection to the size or age of the pigs, except that they will not handle weaners or slips if larger pigs are available. The stores they like most are

those from three to four months old that have had good opportunity of growth, but that have had little or no fattening food—pigs that with four or five weeks' good "solid" food will "make up" into first-class baconers. For these latter sorts they will frequently pay more in comparison than the farmer can realise for porkers.

It is good business growing store pigs in quantity for sale as such, but one needs to be watchful of the seasons and food supply, otherwise one might be caught with a heavy supply of pigs on hand and little or no (or very expensive) food available. The ideal condition would be growing store pigs on the cheaper country over the ranges, and fattening them on the more expensive country capable of growing corn and other cereals, and root crops, &c., &c., on the coastal areas.

### Light Porkers.

Good quality well-developed pigs from four to five months old are usually classed as porkers, and they are graded according to weight, quality, and condition into three groups—light, medium (or prime), and heavy.

In the past in Queensland there has not been a sufficiently constant demand for porkers to have warranted farmers catering specially for these grades, but conditions are rapidly changing, and nowadays when the export of frozen pork is being given so much publicity, fresh buyers are offering, and a certain amount of frozen pork has already been shipped from Queensland to ports outside of our own borders and to overseas markets. One firm alone, during 1926, exported 2,800 porkers, purchased here at between 7d. and 7¾d. per lb. dressed weight, at weights between 60 and 110 lb. dressed. The pigs arrived at destination in a satisfactory condition, and created a demand for further and almost unlimited supplies. It will be seen, therefore, that the porker grade is becoming an important one. There is, of course, always a certain quantity of fresh pork on the retail markets of this State, especially in the metropolitan area.

It is a mistake for farmers to send porkers to the bacon factory and expect the factory manager to grade them as bacon pigs and pay for them accordingly—that is, unless they are sent in by arrangement with the factories—for even bacon factories have a certain demand for pork, and in the far North the Northern Pig board handle porkers as well as baconers through the North Queensland Co-operative Bacon Factory. If there is a demand for them at a payable price, porkers, if properly handled, should be more profitable than bacon pigs, as they are ready for market much earlier, and consequently can be produced at a lower price and with less risk. The lighter grades of porkers—say, those dressing about 50 lb. weight—are not as profitable as the prime weight porkers (70 lb. dressed), except to the suburban farmer, who can deliver them to the saleyards or to retailers or consumers in a fresh, clean, prime condition. Porkers cannot stand knocking about to the same extent as pigs carrying more age and weight. To the farmer having porkers for sale the best advice would be to spend some time moving about among pork butchers, stock agents, hotel and cafe proprietors, suburban pig farmers, &c., ascertaining the exact position regarding the market outlet for these animals. See table for ages, weights, and values.

### Medium Weight Porkers.

For pigs of 65 to 70 lb. dressed weight there is, especially during the cooler months of the year, a good local demand. They are more profitable than either the lighter or heavier grades, and provided they are in good, healthy condition, will always realise top prices. Butchers prefer porkers weighing 65 lb. dressed if they can secure them regularly, because they are of a convenient and handy "shop" size, and can be cut up to more advantage than other grades. Porkers are, of course, used in the fresh meat business, being retailed in the form of small joints of fresh pork, pork chops, roast pork, and other forms. Many farmers believe that the bacon-curers can handle porkers to cut up for the sausage trade, but this is not the case, except as referred to above, as factory reports will bear out. In the Southern markets there is a heavy demand all the year round for porkers of good quality and of convenient "shop" weights.

### Heavy Porkers.

For these the demand is not so keen or constant, nor are prices as satisfactory. Altogether they are not as good for marketing purposes as are the medium weights or the better grades of light bacon pigs. There are times, of course, especially in the South, when heavy porkers sell well, particularly if one or more of the carcass butchers have heavy export orders for carcass pork for the Navy or for pickled pork for the "Island" trade. In general, however, it can be said that the heavy porker

is not in demand; he had better be fed for a fortnight or a month longer and be marketed as a baconer, in which class he will realise a price that should more than pay for his keep for this extra period. This is a point far too many farmers fail to realise; the general complaint amongst bacon-curers to-day is that farmers are rushing their pigs into market before they are heavy enough or carry sufficient condition for curing, this especially so in the Southern States, where there is a general "scare" owing to numerous outbreaks of disease among pigs, particularly in the metropolitan areas of Sydney and Melbourne.

**Bacon Pigs—Light, Prime (or Medium), and Heavy.**

As with porkers, the demand for bacon pigs centres more upon the medium and prime weight pigs than upon the lighter or heavier, overfat grades. In fact the very light bacon pig, like the overweight porker, is not desired. He shrinks heavily in weight while in transit, and loses condition very much more as a result of handling. A pig that is too heavy for the pork butcher, yet not heavy enough for the bacon-curer, is in a class that is likely to suffer more on a falling market than any other grade, therefore breeders who desire to secure bacon pig prices should aim at placing their baconers on the market when they are five and a-half to six months old at about 115 to 120 lb. dressed weight (on approximately 165 to 170 lb. live weight). The bacon-curer prefers a pig this size, because the carcass can be

Plate 110.—An Excellent Quartette of Berkshire Porkers in Prime Condition.

Note the clean healthy skin and hair, the fine quality and even development of each animal, and the clean comfortable quarters under which they have their abode.

retailed more profitably in the form of ham, shoulders, flitches, middles, or sides. The heavy bacon pig is a better market animal than the heavy porker, because the former carries a more weighty ham, but he is not as profitable "all round" as the pig of medium weight, and should not be kept so long in the fattening yard or pen. It must always be remembered that the pig is a greedy feeder, and so long as he is feeding he is either doing so at a profit or at a loss to his owner. It pays handsomely to watch the markets carefully and to place before buyers the class of stock most in demand. The demand for bacon pigs is very keen, so much

so that bacon curers have buyers or agents operating in practically every district throughout the State; the competition is so keen that the farmer need have no fear that his stock will not realise market values. Good pigs always realise good current values; whether these values are profitable to the farmer or not is, of course, another question, and one that bears a direct ratio to cost of production and handling. See table for ages, weights, and approximate values.

**Backfatters.**

The term "backfatter" is used by pig buyers to indicate that the pig has passed the stage at which he can profitably be handled as a bacon pig, and that having passed that stage his carcass must be "cut up" into smaller pieces and be used in the manufacture of the variety of small goods for which the carcass of the pig is justly famous. The term "backfatter" also indicates that the pig is a very heavy one, and that he carries the greater portion of his fat on his back or on the upper portions of his body. Backfatters fluctuate in value more than any other grade of pig, and as a class they can fairly be considered as unprofitable; still the class embraces a variety of heavy pigs, old fat sows, barrows, and very heavy bacon pigs that for various reasons might not have been marketed earlier. It would not pay under ordinary circumstances to breed pigs for sale as backfatters, but it certainly pays to fatten up brood sows that have become unprofitable, either on account of age or because they are unsatisfactory as breeders; it pays to cull and fatten up any sow that fails to produce a satisfactory litter twice a year, therefore the backfatter class provides a suitable market outlet for old heavy pigs or for fat pigs over the ordinary market weights. The price varies considerably according to supply and demand and the quality and condition. During the war phenomenal prices ruled for very heavy fat pigs, as much as £22 15s. having been paid at the Abattoir Saleyards, Homebush Bay, New South Wales, for a very heavy fat sow. Prices ranging from £12 to £20 were quite common, but during normal periods these prices are not heard of, though in the markets of the South (Sydney and Melbourne particularly) from £4 to £10 are quite common figures for prime quality backfatters. In Queensland, however, and in Northern New South Wales, these cannot be obtained, hence we have stated the value of backfatters as £3 to £4, a value within the reach of the farmer if his pigs are of sufficiently good quality.

**Stags.**

Old sows are usually graded as backfatters, whilst old boars that have been castrated and fattened up are classed as "stags," and for them the demand is very limited. Stags are purchased for rendering down mostly, the fat goes into the manufacture of lard, the lean meat goes to the sausage tub, and most of the heavy gristly skin (the shield and wrinkly skin along the neck and sides) is cut away by the Meat Inspector and is condemned as unfit for human consumption. "Aged" stags rarely pay for the feed they consume.

**Boars.**

It does not pay to market boars unless one has an abundant supply of very cheap food; they rarely realise more than from £1 to £2, and they will only realise these prices if they are comparatively prime and in good condition. Whether it would pay to castrate them and fatten and market as stags is a very debatable point, and one that can only be answered by the owner. It would not pay to fatten them upon purchased foods unless the food was very cheap and the market rates of pigs reasonably high.

Bacon factory buyers nowadays will not accept boars at all, and all "stags" are accepted only on condition that they have been "emasculated" (castrated) three months beforehand.

**Choppers.**

Pigs that are marketed in a half-fat condition and that are unsuited to the requirements of the pork butcher, or the bacon curer, or for use as back-fatters, are usually classed as "choppers"; the term indicating that they are purchased for chopping purposes—that is, the carcass is chopped up into a variety of pieces and is used either for export as salt pork or pickled pork, or is used in the manufacture of small goods. Choppers vary in price according to their weight, condition, and quality. The class provides a very useful market outlet for a variety of pigs that could not be marketed profitably in the classes for which they might otherwise be suited.

## OTHER STOCK TERMS REFERRING TO PIGS.

Apart from the general classification of pigs for trade and market purposes, there is a breeding classification in which other terms are used to describe the pigs at different stages of growth.

Commencing at birth the young pig is variously known as a sucker, a pigling, a bonham, a piglet; or, in a group, he is part of a farrow or litter.

### The Yelt.

Having passed the sucker stage the young female pig is called a "yelt" or "gilt" until she has produced her first litter. This term "gilt" is quite a common one among farmers from England, Scotland, Ireland, and Wales, but is not a common term in Australia.

### The Brood Sow.

Having produced a litter, the yelt now becomes one of the matrons of the herd, and is henceforth known as a brood sow or as a breeder or breeding sow.

Plate 111.—Down on the Farm.

The Piglet appreciates its bottle. A Domestic Scene on the Farm of Mr. R. Wight, Market Reports' Officer, Station 4 Q.G., Brisbane.

### The Male Pig.

The boar usually retains his title throughout life. The male is often termed the "hog," but in America all pigs are called "hogs" (i.e., the hog industry); in fact, the Americans rarely use the term "pig" at all, and when they do use it, it is to describe suckers or very young stock. The boar does not actually begin his stud duties until he is ten to twelve months old, the sow also should be at this age before being mated.

The term "pig" is now, however, being generally accepted as the correct one for males and females of the "porcine" species, the term "swine" is gradually being dropped, and the term "hog" used to designate the male pig.

### The Barrow Pig.

A male pig castrated whilst young is styled a "barrow." In American literature again both boars, barrows, and sows at the age of about four or five months are styled "shoats," but here they are called "store" pigs, and the term is a general one including all grades; a group of store pigs often includes breeding sows in poor or rough condition—in fact the group might include any class of pig in poor or half-fat condition.

**Runts.**

The "runts" of a litter are the small, weedy, or weakly pigs. They often do not pay for rearing, as they require too much special care and attention.

**Rickety Pigs.**

Pigs that suffer as a result of a long train or steamer or road journey and that arrive at the saleyards or factories "down" in the hindquarter, or that are unable to walk, or that walk with difficulty, are usually styled "rickety" or "groggy" pigs. The term is an erroneous one so far as its reference to the disease called "rickets" is concerned, although pigs suffering from rickets exhibit much the same symptoms.

**Scrub or Mongrel Pigs—i.e., The "Razorback" of American Literature.**

A scrub or mongrel is an animal of mixed or unknown breeding without any definite type or markings. Other terms used to describe mongrels are "bronchos," "razorbacks," "wild pigs," "bush pigs," &c.

PLATE 112.—FEEDING THE ORPHANS.

Mrs. Percy Campbell, of Duroc-Jersey fame, attending to the orphans on the farm at Lawn Hill, Lamington, via Beaudesert. Q.

It is scenes like these that illustrate the keen, intelligent interest Queensland's womenfolk have in farm affairs. A little extra care and attention mean much in matters of this description.

**Purebred, Pedigreed, or Stud Pigs.**

An animal that is included in this class is one of pure breeding, representing a definite, recognised breed, both of whose parents were purebred animals of the same breed. To be classed as purebred, live stock must be either registered, eligible for registration, or (in the absence of public registry for that class) have such lineage that their pure breeding can be definitely proved and recorded. To be of good type and quality, the animal must be healthy, vigorous, and a creditable specimen of its breed; its breeding must be pure.

In Australia the interests of the stud pig breeder are cared for and fostered by the Australian Stud Pig Breeders' Society, which organisation has branches in each of the States. The Queensland Branch Secretary is Miss J. Mackay, Inns of Court, Adelaide street, Brisbane, from whom, or from the Instructor in Pig Raising, further details re the operation of the society may be obtained at any time.

**Thoroughbred.**

In speaking of pigs the term "thoroughbred" means the same as purebred. In American and English literature the term "standard bred" is also largely used. This is a term that we rarely use at all—it refers to the purebred animal.

**Crossbred.**

This term applies to the progeny of purebred animals of different breeds—that is, a Berkshire boar mated to a Tamworth sow produces crossbred pigs; both parents are purebred pigs but of different breeds. The crossbred pig is very popular as a "meat" pig, and is produced for market purposes in practically every district where pigs are bred. Crossbred males should be castrated; they should not be permitted in the herd as sires. The crossbred sow, on the other hand, if of good type and conformation, makes an excellent breeding sow when mated to a purebred boar.

**Grade.**

This term differs from that referred to above, in that it is applied to the progeny of a purebred boar mated to a crossbred sow. Sometimes the term "grade" is used where the progeny are from parents whose breeding is pure, but whose pedigrees for various reasons have not been recorded. The offspring of a purebred boar and a grade sow is also a grade, but through progressive breeding becomes a higher or better grade. When a Berkshire boar is mated to a crossbred Tamworth-Berkshire sow the progeny are called grades. A sow of the latter class mated back to a Berkshire boar frequently produces progeny to all appearances purebreds; they are sometimes called three-quarter breds, having as it were three-quarters Berkshire and one-quarter Tamworth blood in their veins.

Any further information in connection with the classification and marketing of pigs or on any other aspect of pig raising may be had on application to the Department of Agriculture and Stock, William street, Brisbane, Queensland.

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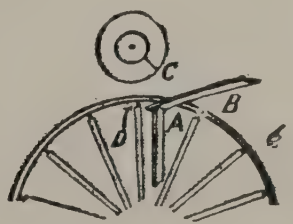
## TIGHTENING SPOKES.

An old device for tightening up buggy wheels which are beginning to rattle is shown in the illustration. A piece of 3 in. by 2 in., A, about ½ in. longer than the spokes of the wheel is set upright on the hub of the wheel alongside the loose spoke. A longer piece, B, 2 in. by 1 in., is rested on the upright with its end under the rim of the wheel, and the rim is raised from the shoulder of the spoke by the lever.




The leather washer, C, which has an internal diameter equal to that of the tenon of the spoke, D, and which is cut through from edge to edge, is placed around the tenon, D, and the rim is released on to the washer. As a rule only two or three spokes will require washering to get the wheel tight. If allowed to go on the wheel will soon be ruined as grit works into the joint and the friction set up soon wears away the tenon and the rim. The washer can be cut a little wider than the spoke and trimmed down with a knife.

## ABSTRACTS AND REVIEWS.

*All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from "The International Review of the Science and Practice of Agriculture," published at Rome by the International Institute of Agriculture.*

### Marketing Problems in England and Wales.

Street, A. W. (head of the Markets and Co-operation Branch of the Ministry of Agriculture): The Problem of Agricultural Marketing (address delivered at Kendal on 8th October, 1927). "Journal of the Ministry of Agriculture," Vol. XXXIV., No. 9. London, December, 1927.—Council of Agriculture for England: Improvement of Marketing of Agricultural Produce. "Journal of the Ministry of Agriculture," Vol. XXXIV., No. 9. London, December, 1927. —Marketing of Farm Produce: Interim Report to N. F. U. "Times," No. 44,743. London, 19th November, 1927.

The question of the marketing of agricultural produce is being widely discussed in England and Wales. On the one hand the improvement of agricultural marketing is advocated as a remedy for the existing depression in agriculture; on the other hand the efforts which are being made to induce the British consumer to give preference to the produce of the British Empire (including in the first rank the produce of England and Wales) has drawn attention to defects in the marketing of the home produce.

The Council of the National Farmers' Union set up last year a committee to inquire into the present and possible conditions of marketing farm produce with the object of devising a scheme for united action by members on a national basis in order to improve the economic condition of agriculture. This committee recently presented an interim report, which does not, however, contain any concrete proposals. It points out that the existing committees of the Council of the Union—the co-operation committee, the fruit and vegetables committee, the milk and dairy produce committee, the sugar beet committee, the live stock committee, &c.—are already dealing with marketing problems, and recommends that no change should be made in the system. The committee maintains that the present depressed situation of agriculture is largely due to the policy of deflation. This policy, it states, has hit agriculture particularly, since as a rule the interval between incurring costs and receiving the return is longer in the case of agriculture than in that of other industries. "No access of marketing skill," says the report, "could have availed to counteract the effects of deflation or to restore the price equilibrium."

The question of marketing has also been brought before the Council of Agriculture for England, and at a meeting on 20th October, 1927, the Council adopted the following preliminary suggestions put forward by the Standing Committee:— "(1) That it is of urgent importance that the agricultural industry should consider the better marketing of agricultural produce in the light of the material now available, with a view to securing for the producer greater control over his product than he has at present. (2) That among the primary objects to be aimed at are closer touch with the consumer and better standardisation both in the quality and quantity of supplies: and that the services which might be rendered in these ways would entitle the producer to receive a larger share of the price which the consumer pays. (3) That, though the assistance of the State would be necessary in setting up the marketing organisation and machinery required for different classes of products, the movement must be primarily that of the producers, success being impossible without a guarantee of supplies. (4) That, in order that the producers should be willing to undertake the responsibility for initiating, setting up, and seeing through new marketing systems, they must be certain in advance that the profits accruing shall be secured to the industry. (5) That the question of benefiting the agricultural community by placing the purchase of wheat and meat, whether home-produced or imported, under national control deserves careful consideration." The Standing Committee was also instructed to prepare a report on the subject for presentation to the Council.

An important contribution to the discussion has been made by Mr. A. W. Street, head of the Markets and Co-operation Branch of the Ministry of Agriculture in an address delivered at Kendal on 8th October, 1927. Mr. Street maintained, like the committee appointed by the National Farmers' Union, that marketing reform is not a remedy for agricultural depression; it is to be regarded as a permanent and necessary improvement in business efficiency of service alike in times of prosperity or of distress. Nor does better marketing, in his view, mean replacing the existing machinery of distribution by a farmer-owned co-operative system.

Co-operation has, nevertheless, an important part to play, notably in the assembling of produce in the areas of surplus production. In average circumstances group marketing is, or should be, more efficient than marketing by individual producers, not only in regard to such services as the preparation, classing, grading, packing, and dispatch of supplies, but in the search for outlets and in the orderly feeding of markets. The ungraded contributions of individual producers must first be assembled in order to provide the bulk necessary for the grading process and for the maintenance of graded output. The present system of direct consignment by individual producers, or sale to local dealers who buy to send away, too often fails to ensure that home produce shall reach the large consuming centres in a form and condition and in large enough units to compete on equal terms with imported supplies. One way of meeting this situation is for producers to co-operate to render the preliminary marketing services for themselves. Collective marketing is a means to an end, but it is not the only means, and it is not essential to marketing reform. In many exporting countries organised assembling and the standardisation of product and package are done by merchants and exporters. Some form of organised assembling is an economic necessity, and if home producers are not disposed to co-operate for this purpose they should encourage and support any business enterprises that undertake to handle produce on up-to-date lines and place it in the hands of distributors in a form which accords with commercial requirements.

The greatest marketing problem which confronts the British farmer is that of devising a workable system for the standardisation of his products. If standard goods are to be marketed they must either be produced to standard or they must be graded into standard categories. For the marketing of standard farm products a standard grading system is essential, though it is possible for the producers of some commodities—e.g., cattle, bacon pigs, table fruit, or poultry—to simplify marketing by standardising their production types. This is a first step towards better and cheaper marketing. Standardised grading increases the speed with which business can be conducted. It provides a basis for selling in which inspection need not invariably precede purchase; it makes possible the accurate determination of values and the quotation of comparable market prices; it reduces buyers' risks, minimises disputes, encourages long-period contracts between sellers and buyers, widens the market, and in general facilitates sale from assembling points in producing areas to distributors in consuming centres. It facilitates credit accommodation and, in particular, the financing of such operations as storage. The standardisation of containers is also of considerable importance. Standardised grading has also an important influence on demand. Ungraded supplies, or supplies graded in a multitude of different ways, cannot make the same appeal to the distributive trades as standardised imported goods that can be handled in bulk and meet requirements in every detail. Moreover some method is necessary by which superior home-grown produce may be definitely distinguished from home produce of lower quality, so that good and bad may not be marketed under the same designation.

The Ministry of Agriculture has already suggested standard grades for a number of commodities, and demonstrated them publicly; others will be suggested and demonstrated as investigations proceed. Mr. Street suggests that a national quality mark, duly safeguarded against misuse, should be introduced as a special incentive to the rapid adoption of the proposed standard grades. It would be necessary to register individuals who were authorised to use the mark and to arrange for the sampling and inspection of consignments. The use of the mark would, however, remain entirely voluntary, and only those who wished to take advantage of it would be subject to the measures necessary to ensure that the mark was really a guarantee of quality and reliability. For convenience of administration it might prove desirable to delegate responsibility for controlling the use of the mark to area associations of producers and others concerned; each commodity would require a separate organisation for this purpose. The adoption of a national quality mark would greatly facilitate, as far as home produce is concerned, the advertising campaign which is being conducted by the Empire Marketing Board in support of produce grown in the British Empire.

### Maize Marketing in South Africa.

The South African Agricultural Union Congress. The Organisation of the Maize Industry. "The Farmers' Gazette," Vol. V., No. 154. Pretoria, 4th November, 1927.

Following on the conferences held during 1927 on the subject of the organisation of the South African maize industry (1), the Central Agency for Co-operative Societies, Limited, approached the Land Bank, offering to find the sum of £1,000 for the organisation campaign, the object of which is to induce maizegrowers to form a central co-operative sales agency, provided that an equal amount be granted by the

Land Bank. The Board of the Land Bank has replied in the following terms:—1. The Board recognises the desirability of all maize being sold through one channel, in order to secure a reasonable return to the producer. 2. Propaganda work among individual growers of maize towards inducing them to join in some scheme which has that end in view is advisable. 3. The Board will be prepared to grant an amount not exceeding £1,000 to the South African Agricultural Union to be used solely for such propaganda work, provided that (*a*) the Central Agency for Co-operative Societies Limited as representing the co-operative maizegrowers provides a similar amount; (*b*) these amounts constitute a fund for propaganda among maize farmers on lines approved by the Board; (*c*) before any grant will be made, the Board must be satisfied that the South African Agricultural Union and the Central Agency for Co-operative Societies with the co-operation of the Department of Agriculture and the Bank have formulated a plan of propaganda which has a reasonable chance of success, and that the amount of £2,000 is sufficient to cover the expense of carrying out that plan. Negotiations between the Committee, the Central Agency, the Land Bank, and the Agricultural Department are proceeding.

## FAT LAMB RAISING.

Lamb-raising may be regarded as a special branch of sheep-farming, the object being to produce a lamb with exceptional early-maturing qualities, and with a shapely, compact carcass of the proper weight at or before the weaning stage—five months. To the small wheat and sheep farmer the raising of fat lambs should prove a certain source of income if the conditions are suitable and if he employs the right methods. The flesh of prime lambs is worth, on an average, 1½d. to 2d. per lb. more than ordinary mutton, and it must be remembered that the lambs are disposed of at five months old.

The lamb required for the export trade is one which will dress from 33 to 40 lb., having a plump, symmetrical carcass with a good distribution of fat and lean, and as fine as possible in the bone. Lambs with the above qualifications are termed "firsts," while those weighing 28 lb. to 33 lb. are "second grade," and lighter weights "third grade." Heavier lambs than 40 lb. are not liked by the trade.

What is required is a plump, well-shaped, sappy lamb, weighing between 30 lb. and 40 lb. Slightly heavier weights are not objected to so long as the lamb is not dry and old, and lighter weights also will sell well if fat and plump, but "slab-sided," leggy lambs do not meet the requirements of the local market and only realise low prices. The main point is that the lambs must have plenty of bloom and this can only be assured by giving them the best possible conditions right up to the time they are trucked.

On account of coming direct from their mothers, lambs cannot be expected to stand a long railway journey so well as older sheep. During departmental trials in cross-breeding of sheep carried out at Wagga, Cowra, and Bathurst Experiment Farms, New South Wales, from 1913 to 1919 the loss in transit was considered. Each year the lambs were weighed at the farms just prior to despatch and again immediately on arrival at Flemington, receiving no feed or water in the meantime. Putting all farms together the average loss of weight in transit amounted to 7.6 per cent. of the total live weight; that is on a lamb weighing 70 lb. the loss was 5 lb. 5 oz. These figures reveal that a considerable loss occurs and this loss must detract a good deal from the appearance of such a young animal. The distance from market is therefore an item of importance when considering the question of lamb-raising.

When trucking it is a good idea to leave the lambs with their mothers till they arrive at the yards. The lambs then enter the trucks full and contented. In any case some of the ewes should be left with the lambs till they arrive at the trucking yards, otherwise the lambs will be very hard to drive, and may knock themselves about unduly.

To market a lamb as described, good food and plenty of it is essential at all times during the growth of the lamb. Any check due to a shortage of feed means a decrease in the milk supply from the mother, besides a smaller amount of feed collected by the lamb itself from the pastures, and the lamb will never properly recover. The lamb must be grown during that season of the year when the best feed is available, and should be marketed before or as soon as the pastures begin to dry off. The drying off of the pastures will mean a drying of the lambs, and they will lose that sappy nature and bloom which is so desired.

## HORSE VERSUS TRACTOR.

There is a growing opinion among farmers that the subject of horse and tractor is not after all essentially contentious—in other words, that each has its utility on the farm. This was somewhat the point of view expressed by Mr. R. P. Greer, of Emerald Hill, near Gunnedah, N.S.W., in an address before the recent annual conference of the Hunter and Lower North Coast branches of the Agricultural Bureau.

One of the most acute problems facing the farmer, said the speaker, was the cost of production. Under the present disorganised system of marketing, the primary producer was unable to "pass on" any increased cost of production, and until he could be persuaded to take advantage of such beneficent legislation as the recently passed Marketing of Primary Products Act, his only way of combating higher prices for everything that he bought, and lower prices for all that he produced, was to lower as far as possible his own working costs.

Having reached this conclusion, he was ready to fall victim to advertising campaigns designed to show that the easiest way to reduce his working costs was to buy a tractor and get rid of his obsolescent teams.

### Two Questions to Consider.

As far as the cost of cultivation was concerned, it might be shown on paper that the figures for any given cultural operation were somewhat about the same, whether performed by tractor or horses. But how did the thing pan out in actual practice—in hard cash expenditure? His own experience, which was not a lengthy one, was that horse work was much cheaper than tractor operation, even when the teams had been fed on chaff that was saleable on the farm at £6 to £7 per ton and on grain at 5s. per bushel. His records were not complete—he was now keeping accurate note of the various costs with a view to eliminating those that were avoidable—but the figures he had kept (and which he detailed) showed tractor ploughing (based on 100 acres with a ten-furrow implement) worked out at 2s. 7d. per acre, as compared with 1s. 7d. per acre for horse ploughing (based on 100 acres with an eight-horse team).

Owing to the pressure of work no tabulated records were kept of harvesting operations, but the horses were getting only one feed per day—at midday—with one man looking after header and team, while kerosene had to be kept up to the tractor, and two men were required, one driving and one on the header. In spite of this extra expense, he thought that a tractor was particularly useful at harvest time, as it did not tire, and could be kept going throughout the best part of the day, when the horses should be spelling.

### The Horse has still a Place on the Farm.

Accurate and dependable statistics showed that, so far from horses becoming extinct in America, sagacious Canadian and American farmers were importing more and more pedigreed and highly-priced Clydesdales, Percherons, Shire, and other draught horses. But, notwithstanding that horses were indispensable on the farm, power farming had come to stay, for in these days no farmer who put in an extensive area could afford to be without a tractor, since in many cultural and harvesting operations, where time was the essence of the contract, the tractor was invaluable.

This should not induce the farmer to scrap his horse teams, which, for ordinary routine work, were still the cheapest power units on the farm, with the greatest reselling value. Once the tractor left the garage that grisly spectre—depreciation—perched beside the driver. Day by day the tractor's value depreciated, and in a few short years (much fewer than the average working life of the horse) the poor old tractor was on the scrap heap. Not so with the horse teams. Their value should appreciate for many years; old horses might be replaced by their own progeny, and surplus fillies and colts sold advantageously, particularly if a little care had been taken in the selection of a good type of brood mare, and the services of a good sire secured.

And the farmer who was breeding along right lines need not fear the bogey of over-production, for throughout the world there was scarcity of good draught horses. One had but to look at the prices being obtained for suitable draughts at Flemington to realise that horse-breeding was a profitable business, and that it was one that no farmer could afford to neglect.

# Answers to Correspondents.

**Dehorning Cattle.**

A.M.T. (Cooran)—

The simplest and most humane way of destroying the horns seems to be to prevent them from developing when the animals are young. This may be done by the use of caustic potash (in the form of sticks), which rapidly destroys the skin and other tissues when kept in contact with them. The method of applying the potash is very simple. The hair is clipped away from the young horn, so that the potash may come in immediate contact with the parts to be treated. The stick of potash is rolled up in a piece of paper, so as to leave one end exposed. The exposed end is moistened slightly and rubbed on the embryo horn for a few seconds, or until the skin begins to smart, care being taken that the whole of the border is included in the treatment. A surface about three-fourths of an inch in diameter will cover the parts in calves a few days old. The best time to apply the potash is between the fifth and tenth days, although it has proved effectual even on the eighteenth day. With older animals a dehorning instrument must be used. Dehorning does not affect the milk production and has the advantage of preventing dairy cows injuring each other by horning when passing in and out of yards.

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## BOTANY.

*The following reply has been selected from the heavy outgoing mail of the Government Botanist, Mr. C. T. White, F.L.S.:—*

**Chaulmoogra Oil—"Topped Lavender."**

J.F.B. (Nerada)—

Three closely allied plants are of importance, as the source of "Chaulmoogra Oil":—*Taraktogenos Kuizii* (Burma), *Hydnocarpus Wightiana* (India), and *Hydnocarpus anthelmintica* (Siam). All have been introduced through the efforts of Dr. J. F. Rock—working on behalf of the United States Department of Agriculture—into various tropical countries. Seeds of at least two species have been introduced by the Commonwealth, and if you write to the Director of Tropical Hygiene (Dr. Cilento), Brisbane, or perhaps, the Officer in Charge of Tropical Medicine, Townsville, you would obtain particulars as to the trees now growing in Queensland and the Northern Territory.

The Topped Lavender of Southern Europe, referred to by Mr. Bailey in his booklet on Economic Plants, is *Lavandula stoechas*. This does not do very well in Queensland, except in the cooler parts of the State. If you want to try it, however, you could obtain plants from Southern nurserymen. Messrs. Hazlewood Bros., Epping, New South Wales, quote plants at 1s. 6d. each.

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**Readers are reminded that a cross in the prescribed square on the first page of this "Journal" is an indication that their Subscription —one shilling—for the current year is now due. The "Journal" is free to farmers and the shilling is merely to cover the cost of postage for twelve months. If your copy is marked with a cross please renew your registration now. Fill in the order form on another page of this issue and mail it immediately, with postage stamps or postal note for one shilling, to the Under Secretary, Department of Agriculture and Stock, Brisbane.**

# General Notes.

**Staff Changes and Appointments.**

The Police Magistrate, Bowen, has been appointed Government Representative on the Bowen Dingo Board, and Messrs. A. H. W. Cunningham, F. S. Isbell, J. E. Kelly, and G. Massy, junr., have been elected Members of that Board.

Constables C. Elliott and E. A. Sellars, of Tinana and Port Douglas respectively, have been appointed Inspectors of Slaughter-houses.

The appointment of Mr. J. J. McLachlan as Poultry Inspector has been confirmed as from 6th February, 1928.

Mr. H. Keefer, Pittsworth, has been appointed Chairman of the State Wheat Board for twelve months as from 1st September, 1928.

Mr. C. H. Wolff has been appointed Temporary Inspector under the Diseases in Plants Acts for a period of two months as from 1st September, 1928.

**Swine Fever Carried by Starlings.**

At the annual conference of the Institute of Inspectors of Stock of New South Wales, in Sydney, Dr. H. R. Seddon gave an outline of the work that is being carried out at the Glenfield Veterinary Research Station, of which he is the Director. He dealt with the progress in the war against various diseases, and made particular reference to swine fever. When he visited areas at Botany, where the disease had broken out, he found that adjoining pens were not affected in sequence, but he was attracted by the large number of starlings in the vicinity, and decided to carry out an experiment at Glenfield. A pen of healthy pigs were placed in proximity to pigs with fever, and the area was enclosed with netting. Six starlings were placed in the area, and they fed in one pen and then in the other. The healthy pigs became affected, showing that the birds carried the virus on their feet.

Swine fever, he explained, was a disease that was difficult to diagnose. Usually the first symptom was that the animal lost its appetite, and this usually occurred three or four days after exposure to infection. This stage was closely followed by a rise in temperature, quite often to 106 degrees. The animal then adopted a characteristic attitude in standing, the head and tail dropping and the back arched. Diarrhœa was a constant symptom, and the pig wasted very rapidly. Coughing was not constant unless the animal was suffering from pneumonia.

**Fallowing as a Vital Factor in Successful Wheatgrowing.**

There is no phase in modern farming practice that deserves more attention than the problem of how to maintain an adequate supply of moisture in the soil. Lack of sufficient moisture at the right time does more to reduce the yield of wheat crops in this State than even the lack of available plant-food. This does not refer particularly to periods of drought, such as that experienced during the last wheat-growing season, for the greatest losses from lack of moisture are not from noticeable droughts, but from unnoticed dryness that merely lessens the crops year by year, reducing the average and lowering the standard. So throughout the wheat areas the problem of paramount importance in crop production is how to supply moisture at the right time in adequate quantity, and the solution to the problem is "fallow."

It is unwise to attempt to standardise methods of fallowing, for much is dependent on factors such as climatic conditions and the nature of the soil, but an understanding of the underlying principles of the cultivation methods will enable the farmer better to apply his own judgment as to how and when the various operations should be conducted to suit his own particular conditions.

It is scarcely necessary to mention how important it is that sufficient water should be supplied to enable the wheat crop to live and grow. Water forms from 50 to 90 per cent. of green plants, and a considerable portion of the dry matter of the plant is produced from water and carbonic acid gas obtained from the air. But this is a mere bagatelle compared with the enormous quantity of water which is being constantly taken from the soil by the minute root hairs radiating from the roots, and which passes upward through the stem to the leaves where it is finally evaporated. This process is known as "transpiration," and many experiments have been conducted to determine the amount of water that thus passes through plants in the production of 1 lb. of dry plant substance.

The transpiration is not the same for all plants, nor is it the same under all conditions for the same plant. Both the amount of water evaporated from the

soil and that transpired by the plant leaves increase materially with an increase in the temperature during the growing period, and they are much greater under a clear sky and in districts where the atmosphere is dry—conditions which prevail in most of our wheat areas. When, late on a hot day, a crop is seen to be wilting, the rate of transpiration has exceeded the rate of supply of moisture. In the drier wheat districts it is estimated that approximately 500 lb. of water are required to thus pass through a wheat plant for the production of 1 lb. dry matter.

It would therefore take sixty times 500 lb.—or 30,000 lb.—of water to produce a bushel of wheat. But in order to produce this grain a certain amount of straw —about half the weight of the whole plant—must be produced. Therefore to produce 1 bushel of wheat it takes 60,000 lb. of water, equal to 27 tons.

This may appear a very large figure, but in comparison with the amount of water that falls as rain, it is not so extraordinarily large—1 inch of rain over 1 acre weighs 101 tons. If all this could be stored in the soil and used wholly for plant production it would produce, at the rate of 27 tons of water per bushel, about 3¾ bushels of wheat. Thus 10 inches of moisture represents 37 bushels. It is impossible, however, to bring all the rain that falls into the soil and store it for plant use, and it is not possible to treat soil so that all the stored moisture may be used for plant production; for instance, some must of necessity be evaporated directly from the soil. Experiments have shown, however, that it is feasible by cultivation methods to conserve half the rainfall, so that the yields mentioned are possible every other year.—"Agricultural and Pastoral Notes," New South Wales Department of Agriculture.

**Points in Dairy Practice.**

Dairy cows should be fed and milked with persistent regularity; avoid changing milkers; avoid any abnormal changes, and preserve quietude in all operations.

Less feed is required in winter if artificial warmth is provided. Shelter or rug cows in winter.

Stimulate the digestive functions of cows by giving them a variety of foods, and always give access to salt.

Occasional changes of diet are useful, but should be effected gradually.

Mixtures of concentrated feeds are better than one, and are more economical.

Reject all musty or mouldy food.

Salt licks, good water, clean, airy, well-lighted, and well-drained sheds are desirable adjuncts to good food.

**Obituary.**

The news of the death of Mr. W. H. Brown, Editor of the "Agricultural Gazette" of New South Wales, which occurred in Sydney on 10th August, was received with great regret.

Mr. Brown was appointed to the New South Wales Department of Agriculture in 1912 as Editor of "Agricultural and Pastoral Notes," and the success of that news-sheet as a means of keeping the country Press in touch with Departmental recommendations and methods was entirely due to his efforts. In 1914 he was appointed as Assistant Editor of Publications in his State, and five years later was promoted to the position of Editor, which he occupied until the time of his death.

His extensive experience in journalistic work on the agricultural columns of newspapers, both in New South Wales and in New Zealand, enabled him to accumulate a vast store of knowledge on matters agricultural, and this, coupled with the fact that he was widely read and possessed of great capacity, resulted in the standard of the numerous Departmental publications being raised to a high level, which has been greatly appreciated by the farming community throughout New South Wales and neighbouring States.

Apart altogether from his work, Mr. Brown's kindly and courteous nature endeared him to all with whom he came in contact, and he will always be affectionately remembered, not only by his fellow officers, but by fellow inky wayfarers who worked with him for the general benefit of Australian farmers.

# The Home and the Garden.

## FLOWERING SHRUBS.

By Mr. E. W. BICK, Director of the Botanic Gardens.

From an address delivered at the May meeting of the Queensland Horticultural Society.

A few years ago many varieties of Abutilons were grown, but now comparatively few are to be seen. In America Abutilons are known as the Chinese Bell Flower; here the vernacular is Chinese lantern. The best known are Boule de Niege (white), Golden Fleece (yellow), Thompsoni, both in single and double-flower forms, with variegated yellow and white foliage. Souv de Bonn and Sawitzii are two kinds with silvery variegations. Any of the above are well worth growing. Abutilons are easily propagated from cuttings. They belong to natural order Malvaceæ, or Mallow family.

Hibiscus, in the same natural order, are divided into several groups, one of the most prominent being *Rosa-sinensis*, to which class most of the hibiscus seen in our gardens belong. The hibiscus syriacus types are deciduous, and will stand a much colder winter than ours. They are largely grown in Melbourne and Adelaide, as they thrive better than the *rosa-sinensis* under the conditions there.

### Hibiscus.

There are many different kinds of *Hibiscus rosa-sinensis;* the number is said to be several hundreds. A dozen of the best are Peach Blow (pink), Conqueror and Tango Queen (buff yellow or apricot), Island Empress and Island Queen (double and single deep rose), Rose Morn (old rose), Gloria (Chinese orange), George Harwood (single pink), Fulgida (scarlet, with black centre), Double Red, General Courtegis (large, single red), and Schizopetalus, the so-called Japanese fuchsia or Tassell Hibiscus. The latter seeds freely, and is a useful kind for cross-fertilisation purposes. Hibiscus stand pruning well, and is useful for hedges. When utilised for this purpose use all one kind, as there are many variations in growth amongst the different kinds. Hibiscus strike readily from cuttings.

### Azaleas.

Azaleas, the beautiful spring flowering plants, deserve more attention and should be more often seen. The type best suited for local growth is *Azalea indica*, with single flowers; the semi-double and double kinds are largely grown in the South.

### Rhododendrons.

Rhododendrons also are grown in the South, but even there, apparently, they thrive best in fairly high altitudes. It is of interest to note that there is a native rhododendron found in Queensland, near the summit of Bellenden Ker, also at Mount Sturgeon. Azaleas are slow in growth, and are obtained best from layers.

### Other Shrubs.

*Galphimia glauca*, a yellow, free-flowering shrub from Mexico, was growing in both the Botanic Gardens and Bowen Park in 1885, but is not often found in private gardens. It is well worth growing, as it flowers continually throughout the summer months.

*Murraya exotica* and *Murraya paniculata* are both dense-growing shrubs, with English box-like foliage. Both have white, strongly-scented flowers. Those of exotica are borne in denser terminal clusters than those of paniculata, and the foliage of the latter is rather coarser. Murraya is sometimes called Mock Orange, also Indian satinwood. It should not be planted near dwellings, as the heavy scent is apt to be overpowering.

*Ochna atro-purpurea* is a shrub from Natal well worth a place in gardens. It has yellow flowers. After the petals fall off, the calyx develops from green to a bright red tint, and from its centre shining black carpels containing the seeds are produced that provide quite an ornamental appearance.

The Crotalaria or Rattle pods, a number of which are weeds, provide two species of interest in *Crotalaria Cunninghami* and *C. laburnifolia*, commonly called bird flowers from their resemblance to birds. Possibly they are more curious than beautiful; they are propagated from seed.

In the same order *Sesbania tripetta* occurs. It is known as the Argentine Glory Pea, and although somewhat straggly in growth, has a fine effect when carry-

ing its large clusters of orange red, pea-shaped flowers. Many persons have attempted to grow this plant in Brisbane, but only a few have been really successful. It requires a well-drained light soil.

*Cæsalpinia Gilliesii*, the Bird of Paradise flower, is a free-flowering and attractive shrub. The red flowering form *Cæsalpinia pulchersima* is well worth a place in a large garden. Its beautiful scarlet flowers with long stamens and yellow markings are borne throughout the summer months on erect stems, at the base of which seed pods form whilst the flowers are still forming at top.

Cassias (although many are trees) provide some free-flowering shrubs. *Cassia corymbosa* flowers abundantly at this time of year, the whole plant being covered with a mass of golden-yellow blooms. *Cassia didymobotrya*, said to have been brought from Egypt by members of the A.I.F., has particularly fine foliage, is robust in growth, and remains in flower many months. *Cassia artemesioides*, Desert Bush, is also free-flowering. In spring, although somewhat subject to borer pests, this native shrub is well worth a place.

*Callianara pulcherrima* is a strong-growing, red-flowering shrub from Mexico. The long stamens give it quite a bottle brush and attractive appearance. In *N. O. Rosaceæ* we have the Spireas double and single May, *S. Reevesiana* and *S. bella*, also *Kerria japonica*, a small-growing shrub with clusters of yellow flowers, another old favourite now almost out of cultivation.

*Photinia serrulata*, the Chinese hawthorn, is a close relative of the loquat. It bears large flat heads of small flowers that are very attractive to bees. The well-known Indian hawthorn, *Raphiolepis indica*, also occurs in this order. *R. ovata* is a very dwarf, slow-growing shrub compared with its robust relative indica, and on account of its large size is only fit for big shrubberies. *Raphielopis intermedia* is quite the best of the three, the flowers being finer than indica, and its growth an improvement on that of ovata.

Hydrangeas are worth more attention than they are receiving. They delight in a well-watered, preferably shady situation. There are a number of good new kinds. Most of those grown locally are *H. hortensis* and its varieties. We have one that was sent as a red-flowering variety, but when it flowered it was a bright rose pink, certainly not red.

The *Deutzias* are small in growth, with pretty lily of the valley shaped spikes of flowers. *D. scabra* and *D. crenata* do well about Brisbane. *Philadelphus coronarius*, Mock orange, and its variety, *grandiflorus*, although coming from quite a cold district of the Himalayas and Thibet, also do well here. Its fairly large white flowers with creamy stamens are borne in clusters or racemes, and, as its vernacular implies, are strongly scented.

*Escallonia montevidiensis* comes, as its name suggests, from Brazil. It is a large shrub and bears big clusters of small white flowers. This plant requires plenty of room.

The *Pleroma*, or *Lasiandra*, also called *Tibouchina*, is another South American family, chiefly from Brazil. *Lasiandra Fontainesi* and *L. Macrantha* are the two best known here. Both have large, deep rich violet-blue flowers. Macrantha has the largest flowers and foliage and a dwarf habit of growth, whilst Fontainesi has smaller flowers and leaves and is taller of growth and somewhat straggly in habit.

*Heeria rosea*, or *Heterocentrum roseum*, is another small-flowering plant which has also apparently gone out of cultivation. It belongs to Mexico, and the flowers are numerous and small, of a bright rose colour, borne on terminal panicles.

*Cupheas platycentra* and *jourellensis* have small, tubular flowers borne in clusters; *C. platycentra* has bright red flowers tipped with white, whilst *jourellensis* has larger flowers of a dull red tint.

The *Lagerstræmias* are well known to all. *L. indica* is the common red, and its numerous garden hybrids in pink, white, mauve, &c., are those usually seen in cultivation. The most striking of all is *L. Matthewsii*, with its large terminal clusters of crinkled lilac-purple flowers. It is interesting to note that there is a native *Lagerstræmia, L. Archeriana*, named by the late F. M. Bailey after Mr. Archer, a member of the well-known Central Queensland family. The plant was found on the Palmer River, but there appears to be no record of its having been cultivated.

Although not often seen about Brisbane, the *Laurestinus, Viburnum tinus*, is well worth growing, particularly in cold districts. *Diervilla rosea*, a Chinese shrub, is also worth attention. It bears pale rosy coloured somewhat tubular flowers in clusters on stem.

The *N. O. Rubiaceæ* contains quite a lot of flowering shrubs, including Bouvardia, Rondeletia, Gardenia, Ixora, Pavetta, Hamelia, and Mussændra. Bouvardias are well known, but not cultivated much in recent years. They are not long-lived plants, and

provision should be made for their replacement. *Rondeletia speciosa* is a slow-growing shrub with bright orange-red flowers borne in clusters, not unlike those of lantana. It is suitable for small gardens. *R. versicolour* or *R. amæna* is a much stronger shrub, with beautiful soft pale rose-pink clusters of flowers. It does remarkably well here.

*Hamelia patens* is a useful shrub well worth growing. A few years ago there was a fine plant of it on the Northgate station platform. *Ixoras* are other plants that wax scale often completely spoils. The pest may be destroyed by dusting frequently with lime. The flowers of *Ixoras* are not unlike those of bouvardias, but on a much larger scale. *H. coccinea* and *H. macrothyrsa* are the two most popular kinds. *Coccinea* has orange red flowers borne in large dense clusters; *macrothyrsa* has smaller flowers of a duller colour, and not set so closely together.

There is also a native *Ixora Timorensis*, that occurs both in Timor and in Queensland. It bears white flowers in clusters, and is quite a large shrub. *Pavetta natalensis* is one of our best garden flowering shrubs. It bears profusely clusters of white flowers, and is like a white Ixora. The foliage is dark green and shining, making a good background for the flowers, and insect pests never trouble it. As a garden shrub it should be more often seen.

The lumbagos are useful shrubs in blue, white, and rose coloured flowers. Probably rosea is the most striking; it is rather slow in growth, but flowers freely. It is very suitable for a small garden.

*Nyctanthes arbor-tristis*, or Tree of Sadness, is an interesting shrub; it has numerous white wheel-like flowers with a yellow centre borne on leafy terminal panicles. The plant takes its name from *Nyctos* night *anthos* flowers, in allusion to the flowers opening at dusk and falling off shortly after sunrise the next morning. It is strongly scented during the night.

Of the *Buddleias*, *B. Veitchiana* is a useful shrub with beautiful long racemes of lilac-coloured flowers; it is also strongly scented. This plant should be pruned after each flowering. *Clostrum nocturnum* is night flowering, and although the flowers are rather insignificant the perfume is very powerful, and may be noticed a considerable distance from the plant. *Cestrum elegans* and *C. Newelli* (formerly called *Habrothamnus*) are two very useful flowering shrubs for small gardens. The flowers are tubular, borne in terminal drooping clusters, and of a dark rose colour in elegans, those of Newelli being of a much lighter tint.

*Brumsfelsia*, or *Francisca*, do best in a sheltered situation. The best known are *B. uniflora*, with blue and white flowers, and *Americana*, the flowers of which open white and develop to a deep cream colour. *B. eximinea* has much larger flowers than uniflora, and of a deeper shade of blue in colour. All are strongly perfumed.

The *Allamandas* are chiefly climbers, but *nerifolia* is a shrub with small yellow flowers. *A. violacea* is also usually grown as a shrub. The latter is very distinct from all other *Allamandas*, as the flowers, instead of being yellow, are of a rich reddish-purple, shading to yellowish-white.

Some recently introduced Neriums or oleanders are well worth growing in large gardens. They comprise new shades of reds, pinks, and salmons.

Of the Tecomas, mention may be made of *T. stans* and *Smithii*. *T. stans* is the large shrub bearing big clusters of yellow flowers. *Smithii* is of the same type with smaller and deeper coloured flowers. Many people get mixed regarding tecomas and bignonias. The chief difference between them is that the bignonias have tendrils to cling by, whilst the tecomas have not.

*Graptophyllum Earlii*, sometimes called the native fuchsia, is a compact growing shrub, bearing deep red flowers. This plant is not often met with in cultivation. It is worthy of more attention.

*Clerodendron fallax* and *C. nutens* are favourite free-flowering plants. *C. fallax* is a native of Java. It has large soft leaves, bears clusters of rich scarlet flowers, and delights in a shady, moist situation. *C. nutens* comes from India. It bears long drooping racemes of white flowers that are very effective. Both *Clerodendrons* mentioned are very suitable for small gardens.

*Holmskiolda sanguinea*, an Indian-red flowering robust shrub, is useful in that it flowers during winter, when flowers are scarce. This leads us to *Poinsettia pulcherrima*, or *Euphorbia pulcherrima*. There are four forms of the poinsettia—the type with very large drooping bracts of a vermillion red; another of rather upright growth with smaller and lighter coloured bracts; a double form called var. *plenissima*; and the fourth with creamy-white or pale-yellow bracts. All are effective in the garden. The yellow bracts remind me of *M. Mussænda frondosa*, a leafy shrub from India that bears tiny orange-red flowers surrounded by large bracts, similar to those of the white poinsettia. Unlike the poinsettia, which often sheds most of its leaves when the bracts are developed, the *Mussænda* produces its flowers and bracts all over a leafy dense growing plant, with excellent effect.

## BOUGAINVILLEA.

Anyone visiting the beautiful garden of Mr. Thomas, at Indooroopilly, again this year, will be impressed with the many possibilities of design and effect that can be made with this very hardy and showy climber. The appreciation of the bougainvillea is shown by the hundreds of persons who go to see it in bloom. It is a hardy plant, and loves sunshine, and there is no reason why it should not be more widely grown. A little time and patience will amply repay anyone who contemplates its culture. Cuttings strike readily as soon as the blooming period is over. They should be about 12 in. long. Select last season's growth, and plant in sandy soil in a shady place.

Put the cuttings about 6 in. deep in the soil, and press down firmly. Keep the ground moist, not soaking wet. If you require a more immediate result, obtain plants from the florists in pots. There are about seven different colours to select from. When the plants have grown to a height of 2 ft. then select your design and prune accordingly. To train the plant make a skeleton design of wire, and then trim the plant by removing all shoots that may be growing in a direction that is not required. About May or June pruning must be stopped, as all the new shoots then appearing will be flowering shoots. As soon as the blooming period is over commence pruning again to still improve your design.

There are many methods of growing bogainvillea, and one that finds favour with many is that of planting it around an old tree that is not wanted, and ringbarking the tree when the bougainvillea is firmly established. It will then hang down from the branches of the tree and form a beautiful garland of bloom. It is an evergreen and never appears unsightly.

## DRACÆNAS.

Dracænas are hardy plants with very richly coloured and variegated foliage. They are closely allied to the genus cordyline, with which they are often confused. The difference between the two is chiefly in the character of the fruits, there being generally one ovule in the dracæna and many ovules in the cordylines. Dracænas are among our most beatuiful foliage plants. Propagation is generally by cuttings, which root readily at any time of the year. The old stem of the plant, cut into short lengths and planted in a compost, invariably roots, and throws up shoots which may be potted up. The root suckers which are often found upon old plants are also useful for increasing stock. All that is necessary is to cut them off and pot them.

The best soil for potting the young stock is made of equal parts of loam and leaf mould, with sufficient sand to keep the soil porous. Dracænas do not require large pots, but they must be firmly potted and given plenty of water.

Mealy bugs and thrips are the chief enemies. The large leaves permit of the free use of the sponge. Dracænas are fine indoor plants, but they must not be kept inside for more than a week or so at a time, and they must be kept out of draughts.

## WELFARE OF BABIES.

### Their Care in the Hot Weather.

The following note has been issued by the Queensland Baby Clinics:—

As the weather grows warmer babies need less clothing. In some parts of Queensland the weather is changeable at this seasaon, and the baby's clothing should be regulated by the temperature, not by the calendar. Over-clothing causes sweating, and may lead to irritation and inflammation of the skin. Waterproof coverings over wet napkins are very likely to do this, and they should not be used. When it becomes really hot, the baby will be happier if he wears little or nothing besides a napkin and singlet, with all his limbs free, but protected by mosquito netting against flies and mosquitoes. He enjoys kicking his legs and waving his arms freely, and this is one of the advantages Queensland babies have.

In hot weather babies need rather less food, but more water. Let them have water to drink between their feeds. A baby may be thirsty without being hungry, and if you try to satisfy his thirst with milk, which is a food, you may upset him. Be careful in increasing his diet at this season. If he is being fed on cow's milk, this should be clean and fresh. As soon as possible after delivery put the milk in a small saucepan, which should be used for this purpose only, and bring it to the boiling point. Unless the milk has been properly pasteurised by a trustworthy process, this should always be done. Freshly-boiled or pasteurised milk will keep

quite fresh in an ice box for twenty-four hours, but without ice it cannot be expected to keep fresh for more than twelve hours. An ice box can be made of a kerosene tin placed in a box, with 3 or 4 inches of dry sawdust all round and covered by a lid.

**Diarrhœa.**

Babies who are being artificially fed very easily get diarrhœa in hot weather. It may be caused by over-feeding, by unsuitable food, or by milk which is stale or dirty. If an artificially-fed baby begins to have loose motions, all his food and all his milk should be stopped. He should be given one dose of castor oil to clear out any undigested food, and after that he should have nothing but thin barley water, slightly sweetened, for twenty-four hours. If then he is not quite well you should get medical advice or take him to the nearest baby clinic.

**Gastro-Enteritis or Dysentery.**

Gastro-enteritis or dysentery is a serious disease which may begin gradually with loose motions, but sometimes comes on suddenly with fever, and much weakness and irritability. The motions may be simply loose at first, but after a time they are seen to contain slime tinged with blood, may be very frequent, and attended by much straining. Next month there will be many cases of this disease in Queensland, and some of these babies will die, for this has been so every year. If all our mothers understood how the disease is caused, and why it spreads from house to house, there would be much less dysentery and very few deaths from this disease among our babies.

Dysentery is not caused by the heat. Usually the worst of the epidemic is over before the hottest weather begins, though sometimes it continues right through the summer. Dysentery is not caused by feeding babies on cow's milk, for all diseased germs in the milk are killed by boiling or pasteurising. But it is much more common among bottle-fed babies, whatever food they are getting, than among babies on the breast. The disease is caused by dysentery bacilli, and these disease germs are conveyed by flies from closet pans or other filth to the babies' food. Not only must the food be most carefully protected from flies, but so must the bottles and teats after they have been scalded. Even breasted babies are not safe if they have dummies pinned on to their frocks to invite the disease-bearing flies to settle on them.

Protect your baby against this enfeebling, painful, dangerous, and often fatal disease by natural feeding, by avoiding the dangerous dummy, and by carefully protecting its artificial food from infection by flies.

**Barley Water.**

Take one tablespoonful of pearl barley, wash it carefully, add to it one pint of water, and simmer for one hour. Then make up to one pint from the kettle and strain carefully. Prepare fresh twice daily.

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# Farm Notes for November.

Field.—Farmers are commencing to realise that quick-manuring wheats which possess a degree of rust resistance are more dependable than the slow-growing and often rust-susceptible kinds, which are gradually giving place to these and mid-season varieties.

Growers are advised to make every preparation to work up the surface of the ground immediately after the removal of their crops, so that the soil may be put into good condition to receive any rain which falls, the conservation of which is the best guarantee for the success of the next succeeding crop. Such initial preparation also encourages the early growth of all foreign and weed seeds, and permits of their eradication by the implements used to produce the desired soil mulch. In such manner paddocks are kept clean and the purity of crops is maintained. The careful preparation of areas intended for maize-planting cannot be too strongly impressed upon growers. Deep and thorough ploughing, followed by cross-ploughing and subsequent cultivation of the soil, must precede sowing if success would be attained; and all efforts must be concentrated to obtain a good surface mulch. Failure to follow up the subsequent sowings by harrowing prior to the appearance of the young plant conduces to weed growths and very often entails, by neglect of this operation, subsequent hand-hoeing between the plants in the drills. Harrowing should be discontinued before the plant breaks through the surface, otherwise damage

will accrue to the tender shoots of the young plants. When the young maize plant has hardened up it may, with advantage, be lightly harrowed in the direction of the drills, but such practice must discontinue once the plant has attained a height of 6 inches. Close cultivation by inter-row cultivation implements is necessary after every shower to conserve moisture and to prevent weed growth, care being taken to ensure each cultivation being shallower than the preceding one, and so prevent damage to the root system of the plant, which is extensive. Inter-row cultivation should cease with the advent of the cob on the plant; and, if proper attention has been given to the crop, it should, at this period, be unnecessary. Where crops are planted on the check-row principle, inter-row cultivation is facilitated, and more even crops result.

The French millets (red and white), owing to their rapid maturing qualities, form excellent intermediate or supplementary crops, and are suitable for present sowing. Their value for fodder and seed purposes is worthy of more general recognition at the hands of the average farmer.

Past dry periods have impressed upon us the necessity of providing during good seasons against the return of less favourable ones, and in this connection the cultivation of quick-growth fodder plants appeals to us. Many varieties of useful classes of fodder can be cultivated over a large portion of this State; chief of which, perhaps, are the sorghum family for grain and fodder purposes. Of the latter, Sudan grass has much to commend it, and is fast becoming one of the most favoured by stockowners. Grain sorghums, of which Feterita, Red Kaffir, and the various Milos are examples, should occupy a more prominent position for purposes of horse and pig feeding, and are particularly suited to those localities which are unsuitable for maize production. Some varieties of sorghum have strong frost-resisting qualities, and lend themselves to those localities where provision for some form of succulent fodder is necessary during the winter months.

# Orchard Notes for November.

## THE COASTAL DISTRICTS.

November is somewhat of a slack month for fruit in the coastal districts, as the citrus crop, excepting a few Valencia Late oranges, off-season lemons, and a few limes, is over. Pineapples are also scarce, as the late spring crop is finished, and there are only comparatively few off-season fruits ripening. The main summer crop of fruit in the principal producing districts is only in the flowering stage, though that in the more tropical parts is ready for marketing. It is also a slack month for bananas, as the summer fruit is not yet fully developed, and the bunches that make their appearance are usually poor. They have been slow in developing on account of the comparatively cool weather of winter and early spring, when the suckers were more or less at a standstill. Young suckers should, however, be making vigorous growth now, and the plantation will require constant attention to prevent the stools being overcrowded with too many suckers. Keep the land well worked and free from weeds of all kinds, as good growth now means good bunches in the autumn and early winter. Where there is a danger of the soil washing badly with heavy rain, rows of Mauritius, velvet, or other suitable beans should be planted at right angles to the fall of the land, as the growth they make will tend to hold the soil and thus save any from being washed away. When planting beans of any kind, either to prevent washing or for green manuring, don't forget to manure them, as thereby you will get a much greater yield, and as none of the manure is removed from the soil, as the crop is allowed to lie and rot on the ground, it is all made use of eventually by the permanent crop.

A good all-round manure for a bean crop is a mixture of 1 cwt. of sulphate of potash and 4 cwt. of basic superphosphate or finely-ground phosphatic rock to the acre, and, if the soil is deficient in lime, a dressing of not less than half a ton to the acre will be found very beneficial, as all leguminous plants require lime to yield their maximum return both of haulm and pulse. The pineapple plantations require to be kept in a state of thorough tilth, and no weeds must on any account be allowed to grow. If blady grass makes its appearance it must be stamped out, as once it gets established in the rows it is only a short time before it takes control, and the plantation is ruined, so that it can only be brought back into profit by taking out the pines, killing the blady grass, and, after thoroughly and deeply working the land, manuring it and replanting.

The planting of pineapples and bananas can be continued throughout the month, taking care to see that the land is properly prepared and that the advice given in previous monthly notes is followed. Young papaw plants that have been raised in the seed bed can be set out now, as also can young passion fruit. Citrus orchards require to be well looked after; the ground must be kept in a state of thorough tilth, and if the trees show the slightest sign of distress, owing to lack of moisture in the soil, they must be given a thorough irrigation if water is available for this purpose. The trees should be carefully examined from time to time so as to note when young scale insects of any kind are hatching out, and when this is noted they should be sprayed with a weak emulsion of a miscible oil consisting of one part of oil in forty parts of emulsion, as this is quite strong enough to kill any young scales before they develop their protective covering. As stated in these notes previously, no oil sprays should be used when the trees are suffering from lack of moisture, as they are then likely to do more damage than good to citrus trees. If scale insects are very bad, and it is important that the trees are sprayed, a weak lime-sulphur spray, or even a soap and tobacco or weak resin wash, will kill the young scales as they hatch out. In the earlier districts a keen lookout must be kept for the first appearance of the mites, which are the direct cause of the darkening of the skin of the fruit known as "Maori." The first indication of the trouble is that when the sun is shining on the young fruit it appears to be covered with a grey dust, and if the fruit is examined with a good lens it will be seen to be covered with large numbers of small yellowish slug-like insects which are living on the skin. Spraying with sodium or potassium sulphide washes, as recommended by the Department, or with a weak solution of lime-sulphur, will destroy these insects and prevent the fruit from turning black. Borers of all kinds should be looked for and destroyed wherever found. Water sprouts, if not already removed, should be cut away. Vines will require careful attention, and the vineyard should be kept in a state of thorough cultivation. Spraying for downy mildew and black spot should be continued, if necessary, as well as sulphuring to prevent oidium.

Fruit fly must be systematically fought whenever seen, and special care must be taken to gather and destroy any early ripening peaches or other fruit that may be infested. If this is done systematically by all growers, as provided by the Diseases in Plants Act, there will be many less flies to attack the later crops of mangoes and other fruits.

Leaf-eating insects of all kinds should be systematically fought wherever seen, by spraying with arsenate of lead, and potatoes and tomatoes should be sprayed with a combined spray consisting of Bordeaux or Burgundy mixture and arsenate of lead, so that diseases such as early blight and Irish blight may be prevented and leaf-eating insects, which frequently cause very heavy losses to these crops, be destroyed.

## THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Keep the orchards and vineyards in a thorough state of cultivation, so as to keep down all weed growth and conserve moisture in the soil. This is important, as, if a long spell of dry weather sets in, the crop of summer fruit will suffer severely from the lack of moisture. Citrus trees should be irrigated where necessary, and the land kept in a state of perfect tilth. Spraying for codlin moth should be continued, and all pip fruit trees must be bandaged at the beginning of the month; further, the bandages must be examined at frequent intervals and all larvæ contained in them destroyed. The neglect to spray thoroughly and to attend to the bandages properly is responsible for the increase in this serious pest in the Granite Belt, and growers are warned that they must pay more attention to the destruction of this pest if they wish to grow pip fruit profitably. Fruit fly may make its appearance in the cherry crop; if so, every effort should be made to stamp out the infestation at once, as, unless this is done, and if the fly is allowed to breed unchecked, the later ripening crops of plums, peaches, apples, pears, apricots, and Japanese plums are bound to become more or less badly infested. Combined action must be taken to combat this, the most serious pest of the Granite Belt, and growers must realise that, unless they take this action and see that careless growers do not breed the fly wholesale, they will never keep it in check, and it will always be a very heavy tax on their industry. Rutherglen bug is another serious pest in this district, and is propagated by the million by careless orchardists. The best remedy for this pest is to keep the orchard clean and free from weeds. Brown rot in fruit should be watched for carefully, and, on its first appearance in a district, all ripening fruit should be sprayed with the sodium sulphide wash.

All kinds of leaf-eating insects should be kept in check by spraying with arsenate of lead, and all grape vines, potatoes, and tomatoes should be kept sprayed with Bordeaux or Burgundy mixture, the former for black spot and downy mildew, and the latter for early and late (Irish) blight.

# ASTRONOMICAL DATA FOR QUEENSLAND.

Times Computed by D. EGLINTON, F.R.A.S., and A. C. EGLINTON.

## TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

| | October, 1928. | | November, 1928. | | MOONRISE. Oct., 1928. | Nov., 1928. |
|---|---|---|---|---|---|---|
| Date. | Rises. | Sets. | Rises. | Sets. | Rises. | Rises. |
| | | | | | p.m. | p.m. |
| 1 | 5.34 | 5.50 | 5.3 | 6.9 | 7.42 | 10.9 |
| 2 | 5.33 | 5.51 | 5 2 | 6.10 | 7.42 | 11.12 |
| 3 | 5.32 | 5.52 | 5.1 | 6 11 | 8.49 | ... |
| | | | | | | a.m. |
| 4 | 5.31 | 5.52 | 5.0 | 6 11 | 9.58 | 12 10 |
| 5 | 5.29 | 5.53 | 5.0 | 6.12 | 11.5 | 1.1 |
| | | | | | a m. | |
| 6 | 5.28 | 5.53 | 4.59 | 6.13 | 12.10 | 1.42 |
| 7 | 5.27 | 5.54 | 4 58 | 6.13 | 1.11 | 2.17 |
| 8 | 5 25 | 5.54 | 4.57 | 6.14 | 2.6 | 2.49 |
| 9 | 5 24 | 5.55 | 4.57 | 6 15 | 2 50 | 3.19 |
| 10 | 5.23 | 5 55 | 4.56 | 6.15 | 3.30 | 3.48 |
| 11 | 5 22 | 5.55 | 4 56 | 6.16 | 4 4 | 4 19 |
| 12 | 5 22 | 5.56 | 4 55 | 6 17 | 4.36 | 4 49 |
| 13 | 5.21 | 5 56 | 4 55 | 6.18 | 5.6 | 5 21 |
| 14 | 5.20 | 5.57 | 4 54 | 6.18 | 5.36 | 5.58 |
| 15 | 5.19 | 5.57 | 4.54 | 6.19 | 6.7 | 6.40 |
| 16 | 5.18 | 5.58 | 4 53 | 6 20 | 6.37 | 7.27 |
| 17 | 5.17 | 5.59 | 4 53 | 6 21 | 7.11 | 8.17 |
| 18 | 5.16 | 5 59 | 4.53 | 6 21 | 7.50 | 9.10 |
| 19 | 5 14 | 6.0 | 4 52 | 6.22 | 8 35 | 10.6 |
| 20 | 5.13 | 6.1 | 4.52 | 6 23 | 9.23 | 11.4 |
| | | | | | | p.m. |
| 21 | 5.12 | 6.1 | 4.51 | 6.24 | 10.14 | 12.3 |
| 22 | 5.11 | 6.2 | 4 51 | 6 25 | 11.5 | 1.3 |
| | | | | | p.m. | |
| 23 | 5.10 | 6.2 | 4.51 | 6 26 | 12.5 | 2.4 |
| 24 | 5.9 | 6.3 | 4 51 | 6 27 | 1.6 | 3.6 |
| 25 | 5.8 | 6.4 | 4.51 | 6.28 | 2.8 | 4.12 |
| 26 | 5.7 | 6.4 | 4 50 | 6.29 | 3.11 | 5.20 |
| 27 | 5.7 | 6.5 | 4.50 | 6 29 | 4.13 | 6.33 |
| 28 | 5.6 | 6.6 | 4.50 | 6.30 | 5.19 | 7.37 |
| 29 | 5.5 | 6.6 | 4 50 | 6.31 | 6.28 | 8.54 |
| 30 | 5.4 | 6.7 | 4.50 | 6.31 | 7 39 | 9.58 |
| 31 | 5·4 | 6.8 | ... | ... | 8.51 | ... |

## Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

| | | | |
|---|---|---|---|
| 6 Oct. | ☽ | Last Quarter | 3 6 p.m. |
| 14 ,, | ● | New Moon | 1 56 a.m. |
| 22 ,, | ☾ | First Quarter | 7 6 a.m. |
| 29 ,, | ○ | Full Moon | 8 4 a.m. |

Perigee, 2nd October, at 8 0 a.m.
Apogee, 18th October, at 6 6 a.m.
Perigee, 30th October, at 11 54 a.m.

The occultation of Kappa Tauri, a somewhat larger star will be observable on the 3rd throughout Queensland at various times between 2.35 and 2.50 a.m., depending upon the position of the observer.

Another small star in Taurus will be occulted at Gympie and Maryborough very shortly after the one previously mentioned, but as much as 20 minutes later at some places north and south of those given.

The conjunction of Mars with the Moon on the 5th at 7 p.m. will be unobservable, as both will be below the western horizon. The conjunction of Mercury and the new Moon on the 15th will also be unobservable.

The conjunction of Venus with the Moon on the 16th at 2 p.m. will occur too much in the direction of the Sun to be noticeable.

It will be interesting to observe the apparent proximity of the Moon and Saturn as they draw near the western horizon after sunset on the 18th.

Saturn will be one of the finest objects for observation in a telescope this month, the northern side of the rings being remarkably well displayed.

The occultation of Si ma Sagittarii, magnitude 2.1, will take place on the evening of the 20th abour 9.25 p.m. in Southern Queensland, but half an hour earlier in the far north.

Epsilon Capricorni will be occulted on the 23rd about 10.30 p.m. in Southern Queensland, but as much as half an hour earlier in the north.

Mercury will pass from east to west of the Sun on the 24th, but instead of a transit across the Sun's face it will pass on the south side of the Sun, apparently at a distance for the Moon to intervene.

The occultation of Psi Aquarii will occur on the 25th about a quarter to 10 in Southern Queensland, but not till a quarter past 10 in the far north. A small star in Taurus will be occulted on the 31st soon after half-past 3 a.m. at Brisbane, Toowoomba, and Warwick.

The Southern Cross will approach the south-western horizon early in the evening, and will soon become invisible especially in the latter part of the month.

| | | | |
|---|---|---|---|
| 5 Nov. | ☽ | Last Quarter | 12 6 a.m. |
| 12 ,, | ● | New Moon | 7 35 p.m. |
| 20 ,, | ☾ | First Quarter | 11 35 p.m. |
| 27 ,, | ○ | Full Moon | 7 5 p.m. |

Apogee, 14th November, at 6·6 p.m.
Perigee, 27th November, at 11.30 p.m.

The occultation of Nu Virginis by the Moon will take place about two and a-half hours before sunrise at places as far south as Rockhampton on the morning of the 8th, but somewhat later at Mackay, Townsville, and Cairns.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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